INDEX NUMBER

JOURNAL

of the

INDIAN MEDICAL ASSOCIATION

VOLUME 30 NUMBER 12 CALCUTTA JUNE 16, 1958

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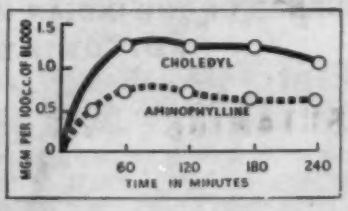

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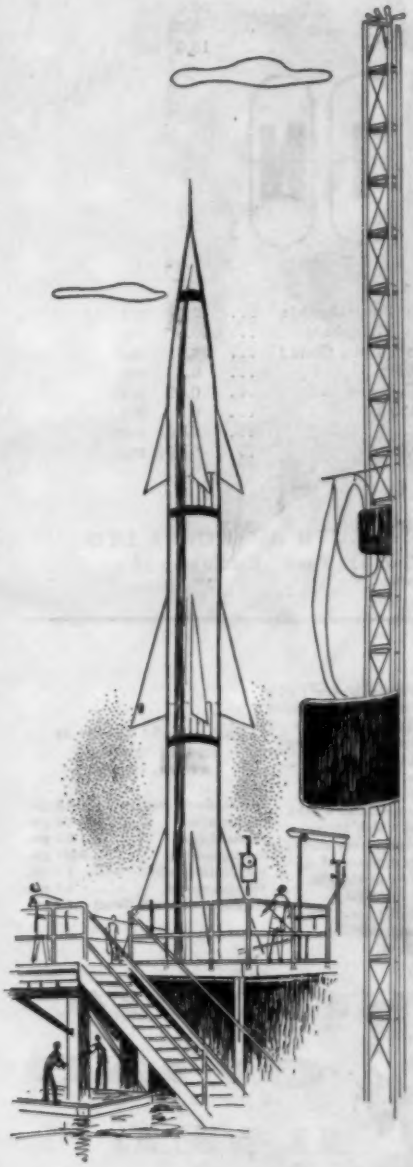

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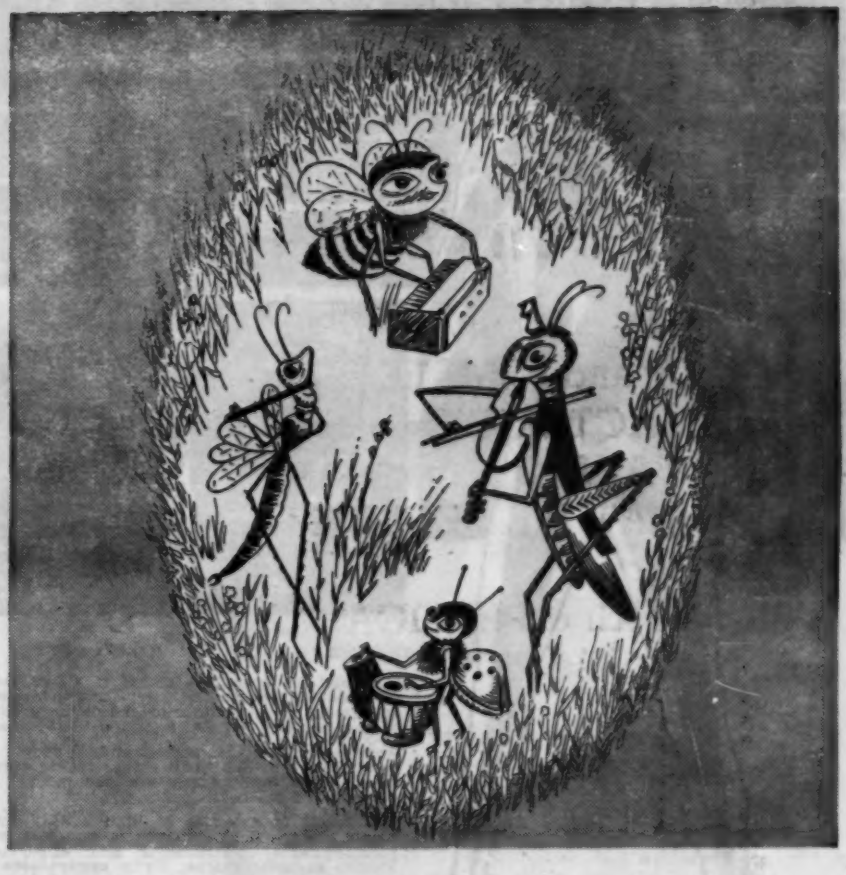

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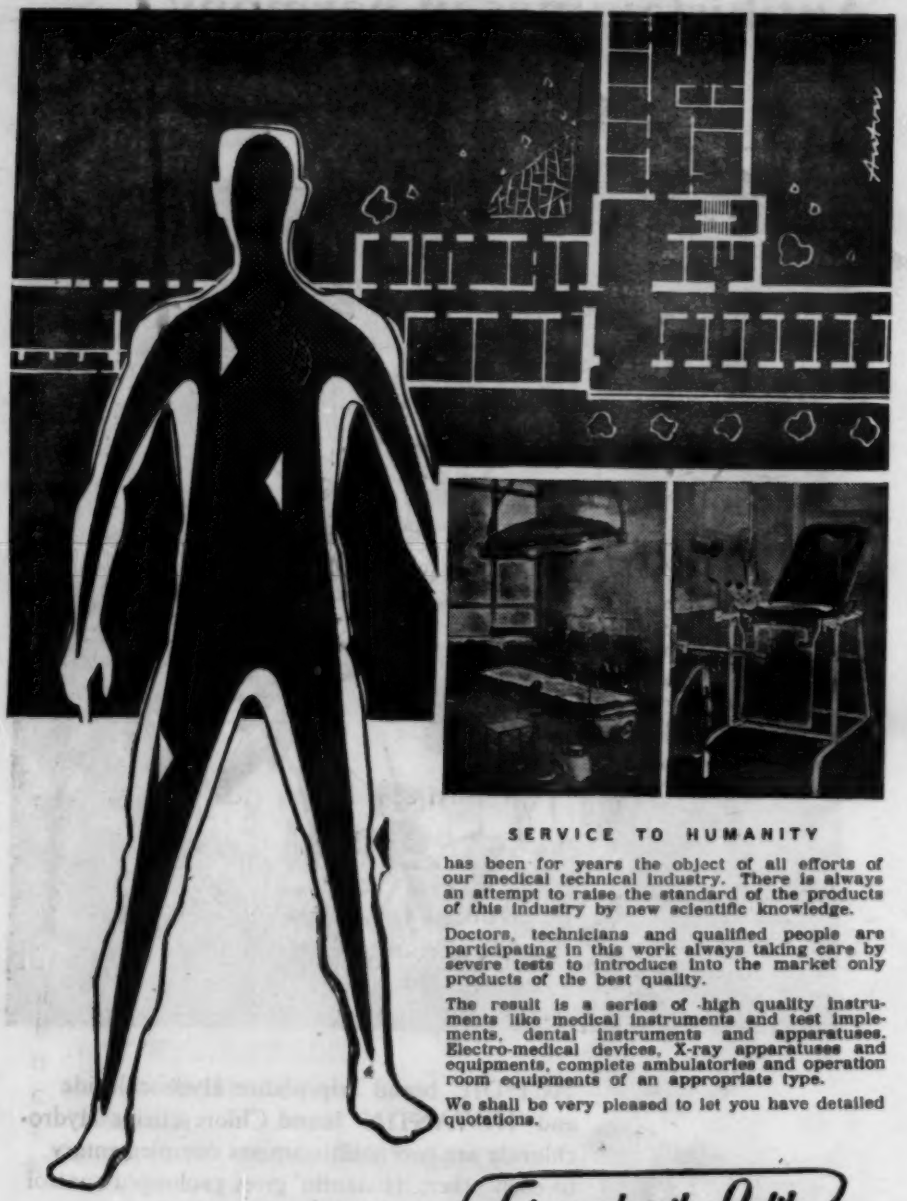

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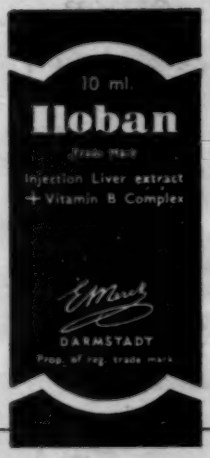

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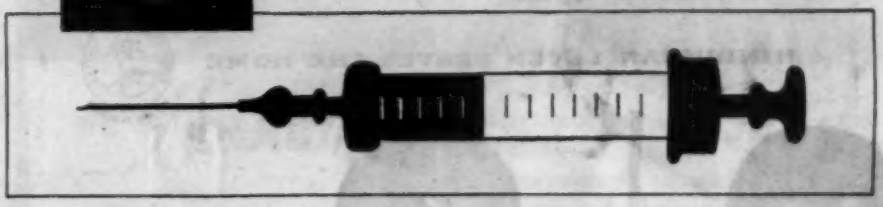

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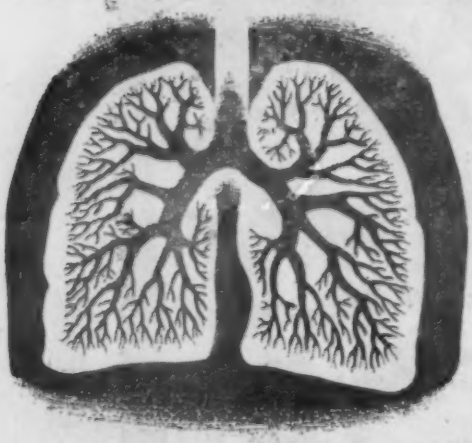

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VOLUME 30
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PUBLISHED TWICE A MONTH
EDITOR—P. K. GUHA, M.B., M.R.C.S. (ENG.), D.O.M.S. (LOND.)

CALCUTTA
JUNE 16, 1958

ORIGINAL ARTICLES

INTRACARDIAC OPERATIONS AT NORMAL TEMPERATURE (AN EXPERIMENTAL STUDY)

PRITAM DAS, M.S., F.R.C.S. (ENG.), F.A.C.S.

Professor of Clinical Surgery, G.S.V.M. Medical College, Kanpur

An experimental study on intracardiac surgery under hypothermia was being conducted in our laboratories. At that time it was decided to give a trial to occlusion of circulation at normal temperature. An initial attempt was made by occlusion of the superior and inferior venae cavae and the azygos vein. The heart could not tolerate the procedure for more than three to five minutes. A trial was then made to try the occlusion of the superior and inferior venae cavae only and to let the blood flow from the azygos vein into the right atrium. Under these circumstances the right atrium could be opened widely without loss of blood from it, and the blood in it could be sucked out completely, at least temporarily, and the various landmarks in it could be visualised.

On looking up the literature it was found that Andreasen and Watson (1951-52) and Cohen and Lillehei (1954) had already established that the two venae cavae could be clamped safely for ten minutes and occlusion up to forty minutes could be survived in experimental dogs. Their survival was dependent on the circulation of blood brought to the heart by the azygos vein. The amount of blood flowing in the azygos vein after occlusion of venae cavae was estimated to be 70 to 80 c.c. per minute by Andreasen and Watson (*loc. cit.*). Cohen and Lillehei (*loc. cit.*) commented that such vital organs as brain, liver and heart could tolerate this massive reduction in their blood supply because of increase in their coefficient of oxygen utilisation.

These studies were mainly physiological. In the work reported here an attempt was made to perform intracardiac operations under these circumstances. Exploration of the right atrium was performed fourteen times and that of the right ventricle and through it of the pulmonary trunk, three times. The behaviour of the heart, changes in the pulse, blood pressure and electrocardiogram were recorded and the safety of the procedure was assessed. No biochemical studies were made.

TECHNIQUE OF ANAESTHESIA AND OPERATION

Adult dogs weighing 18 to 30 pounds were employed in these experiments. Anaesthesia was induced by ether. An intratracheal tube was then passed and connected to an Oxford vaporiser, through which pure oxygen was delivered. Carbon dioxide absorbing arrangement was not used, the expired air being allowed to escape out from the valve and by the side of the endotracheal tube. The femoral vein was then exposed below the inguinal ligament and a polythene tube was passed into the vein. This was used for intravenous saline drip and for administration of sodium pentothal. Soon after canulation 1 to 2 c.c. of two and a half per cent solution of sodium pentothal was given, the dose varying according to the size of the dog. A further ½ to 1 c.c. of pentothal was given every fifteen to twenty minutes intravenously and in all 3 to 6 c.c. of pentothal was required for the whole procedure.

After the chest had been opened, respiration was assisted with the bellows of the vaporiser.

The animal was laid on the left side, the skin was prepared, and draped as for an aseptic chest operation. The chest was opened through the right fourth intercostal space by an incision extending from the side of the sternum to the posterior axillary line. The muscles were divided in the line of incision and self-retaining retractors were applied to provide a working space. The upper lobe of the lung was retracted downwards and the superior vena cava was visualised. The pherenic nerve was separated from the surface of the superior vena cava and the pleura on either side of the vein was incised and the vein was isolated on a rubber tape loosely passed around it above the entry of the azygos vein. Another tape was similarly passed around the inferior vena cava (Fig. 1). A broad rectangular flap of the pericar-

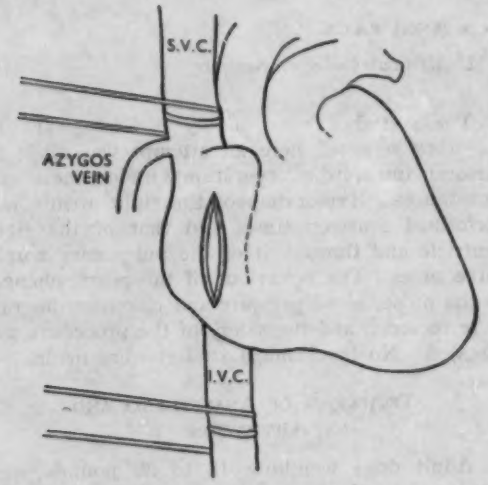

FIG. 1—SHOWING THE TAPES PASSED AROUND THE SUPERIOR AND THE INFERIOR VENA CAVA. THE AZYGOS VEIN IS LEFT FREE TO CARRY BLOOD TO THE HEART. THE CARDIAC INCISION FOR ATRIAL EXPLORATION IS ALSO SHOWN.

dium was turned towards the midline. This gave a wide exposure of the right atrium and the ventricle. The tape around the superior vena cava was now tightened so as to occlude the blood flow through it. Fortyfive seconds later the tape around the inferior vena cava was also tightened. The blood flow through the azygos vein was not interfered with.

ATRIAL EXPLORATION :

For atrial exploration, two stay sutures of 5,0 arterial silk were passed through the anterior wall of the right atrium and the atrium was incised vertically between them. The incision was about one and a half inch in length. There was no loss of blood from the atrium on opening it, although blood could be seen inside it. The blood in the atrium was sucked out but it could never be made completely dry because of blood flow from the azygos vein and the coronary sinus. However the various landmarks like the atrioventricular orifice, fossa ovalis and orifices of the superior and inferior venae cavae could be momentarily visualised. The suction of the atrial blood was made for about a minute only so that the circulation was not deprived of the azygos flow for a period longer than that. Exploration of the atrium was then performed by introducing the index finger into the orifices of the venae cavae, the tricuspid ring and by palpating the atrial walls. The closure of the atrial wound was then commenced at the lower end of the incision with a running continuous suture of 5,0 or 4,0 arterial silk. When about three quarters of the atrial incision had been stitched and while its upper end was still open the superior vena cava was released at the end of ten minutes fortyfive seconds of its occlusion. Blood from superior vena cava completely filled the right atrium expelling all air from it through the upper part of the atrial incision which was kept widely open for the purpose. A little blood was also allowed to escape to make sure that all air had been expelled. Closure of atrial incision was then completed by a second layer of continuous everting sutures applied over the first layer. The inferior vena cava was then gradually released.

EXPLORATION OF THE RIGHT VENTRICLE AND THE PULMONARY TRUNK :

For ventricular exploration two stay sutures were applied in the anterior wall of the ventricle in an area devoid of visible blood vessels about an inch proximal to the pulmonary trunk. The ventricle was then incised between the stay sutures, and only a small amount of blood loss occurred. A curved closed artery forceps or a Brock's dilator was passed through this incision into the orifice of the pulmonary trunk. A finger could also be easily passed. The exploration of the pulmonary ring having been completed, the superior vena cava was released. This filled the ventricle completely with blood and expelled all air out of it. A small amount of blood was allowed to spill out to ensure that all the air was out. The stay sutures were then pulled across incision thus preventing further loss of blood. Incision in the ventricle was then closed with interrupted mattress sutures

TABLE 1—SHOWING SOME IMPORTANT FEATURES OF THE OPERATED CASES

Dog No.	Duration (min.) of occlusion of sup. & inf. venae cavae	Type of exploration done	Ballooning	Auricular fibrillation	Ventricular fibrillation	Sudden cardiac arrest	Air embolism	Cerebral symptoms	Survival period
12	10	Atrial	Moderate	—	—	—	—	—	38 days
13	10	,,	Marked	—	—	—	—	—	30 days
14	10	R-Ventricular	Moderate	—	—	—	—	—	33 days, released
15	10	,,	,,	—	—	—	—	—	46 days, released
16	10	R-Atrial	,,	—	—	—	—	—	Died a little while after operation
17	15	,,	,,	—	—	—	—	Yes	3 weeks
18	10	R-Ventricular	,,	—	—	—	—	—	45 days, sacrificed
19	10	R-Atrial	,,	—	—	—	—	—	3 weeks, escaped
24	10	,,	Marked	Yes	Yes	—	—	—	Died on table
25	11	,,	,,	—	—	—	—	—	2 weeks, sacrificed
27	10	,,	Moderate	—	—	—	—	—	33 days, sacrificed
28	10	,,	Marked	Yes	—	—	—	—	Died on table
29	10	,,	Moderate	—	—	—	—	—	46 days, released
38	10	,,	,,	—	—	—	—	Decerebrate rigidity	Died after 48 hours
45	10	,,	,,	—	—	Yes	—	—	19 days, released
47	10	,,	Marked	—	Yes	—	Yes	—	Died on table
49	10	,,	Marked	Yes	Yes	—	—	—	Died on table

followed by a layer of continuous everting sutures. The inferior vena cava was then released.

The pericardium was closed by interrupted sutures about an inch apart. The pleural cavity was cleared of blood and the chest was closed in layers. Air from the pleural cavity was sucked out for ten minutes after closure, by means of a catheter passed through a stab incision in the seventh intercostal space.

The seventeen operations thus performed are detailed in Table 1. In the post-operative period the animals were kept on 200,000 units of penicillin and a quarter gram of streptomycin daily for four days.

BEHAVIOUR OF THE HEART DURING OPERATION

A number of changes were observed in the size, rate and rhythm of the heart during the period of occlusion. The occlusion of the superior vena cava alone did not appear to make any change, however, as soon as the inferior vena cava was occluded marked changes were observed. In about twelve seconds the right atrium became flabby and collapsed inwards and the whole heart became visibly smaller in size. No cardiac irregularities were observed by occlusion of the veins in any of the cases, but the heart rate became slow in most cases. In some an initial quickening of the heart rate was observed before it slowed down finally. The slowing of the heart rate progressed with the period of occlusion and on an average it was reduced to about 60 per cent of the preocclusion rate. The lowest heart rates observed were 72/minute and 112/minute as against a normal rate of 120 and 204/minute respectively. Fig. 2 depicts the pulse rate observed in an average case. It will be seen that the occlusion of the inferior vena cava caused a sudden drop in the heart rate. The rate shows fluctuations from minute to minute during the period of occlusion but remains low and has a progressive tendency to become slower. In one case no slowing was observed and in two others the heart rate remained quicker than the initial rate throughout the period of occlusion. The release of veins causes a sudden rise to almost normal level. A second phase of slowing is subsequently observed after the release of the circulation. This slowing seems to be in response to the overdistension of the cardiac chambers.

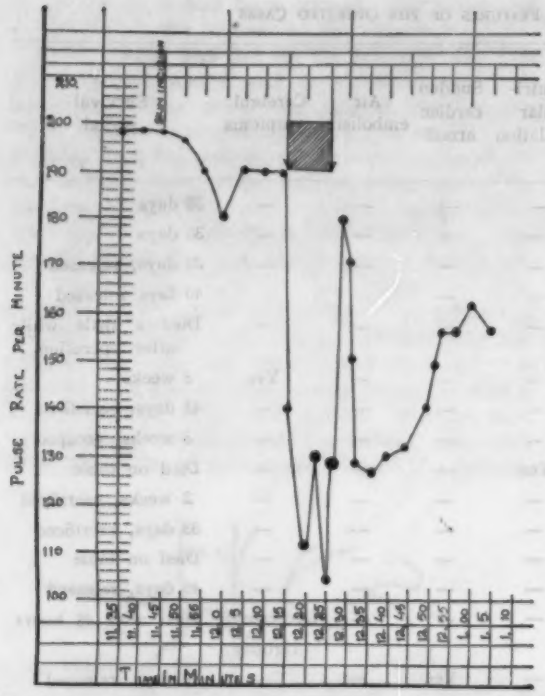

FIG. 2—SHOWING CHANGES IN THE PULSE RATE AS OBSERVED IN DOG : 27 AND THIS REPRESENTS THE PULSE CHART USUALLY OBTAINED IN THESE CASES. THE SHADED AREA REPRESENTS THE PERIOD OF OCCLUSION OF SUPERIOR AND INFERIOR VENAE CAVAE.

Irregularities of rhythm were observed when the atrium was pricked to pass stay sutures or when the finger was passed in the tricuspid ring and orifice of the superior vena cava. At the conclusion of the intracardiac procedure, when the superior vena cava was released the heart became quicker and stronger. On release of the inferior vena cava, the atrium and ventricle became distended and cardiac irregularities in the way of extrasystoles and missing of the beat were observed. In all cases the heart was moderately distended and blue in colour. In six cases the heart got markedly distended, almost ballooned out to the detriment of its function. The period soon after the release of the inferior vena cava was the most dangerous part of the whole procedure due to this overdistension. The condition which will be referred to as 'ballooning' is dealt with in the following paragraph. Out of the six cases in which marked ballooning occurred only two could be revived and four of them succumbed to the condition.

Ballooning—By ballooning is meant the overdistension of the heart. The heart assumes a rounded shape and becomes intensely blue soon after release of the inferior vena cava. The heart beat becomes irregular and progressively feeble. First the right atrium is observed to pass into fibrillation or stop beating even without a preceding fibrillation. The ventricle, after an initial quickening becomes progressively slow and feeble and finally stops in less than a minute's time. Two definite features are present in this picture: one is the overdistension of the right atrium and ventricle and the other is the intensely blue colour of the heart. The factor of overdistension can be avoided by gradual release of the inferior vena cava and this was tried. However, this was not successful in preventing ballooning in all cases, although in some it appeared to be useful. The fault apparently lay with the atrium which was the first to get distended and the first to stop beating. If the atrium kept beating there was every chance that the difficulty would be overcome. The factor of intensely blue discoloration indicated that blood was grossly deficient in oxygen and was in all likelihood loaded with metabolites accumulated in the tissues during the period of occlusion. This factor was fully demonstrated in one case operated under hypothermia.

Under hypothermic conditions ballooning of the atrium was not observed on release of the inferior vena cava. However it occurred in one case. In this case, ten minutes after complete cessation of circulation and atrial exploration when the inferior vena cava was released, the right atrium not markedly distended, intensely blue and the sequence of events was similar to those observed during ballooning at normal temperature. The inferior vena cava was occluded again and the heart was assisted manually to expel the extra blood out of it. This helped a little but not much. The blue discoloration of the atrium gave the idea that an improvement in the respiratory excursion might solve the problem. With this end in view, the cuff around the endotracheal tube was inflated which caused full expansion of the collapsed lung. The ballooning and cyanosis of the atrium disappeared in a few moments. This was in contrast to the prolonged struggle that had to be put in to revive the heart to normal in other experiments. The full expansion of the lungs was then tried in subsequent cases with advantage although it did not eliminate the ballooning completely. There is no doubt that overdistension plays a part but deficient oxygenation of blood during the period of occlusion appears to be an equally important factor. Since this is a major hazard of this operation a further study of these and other factors is necessary.

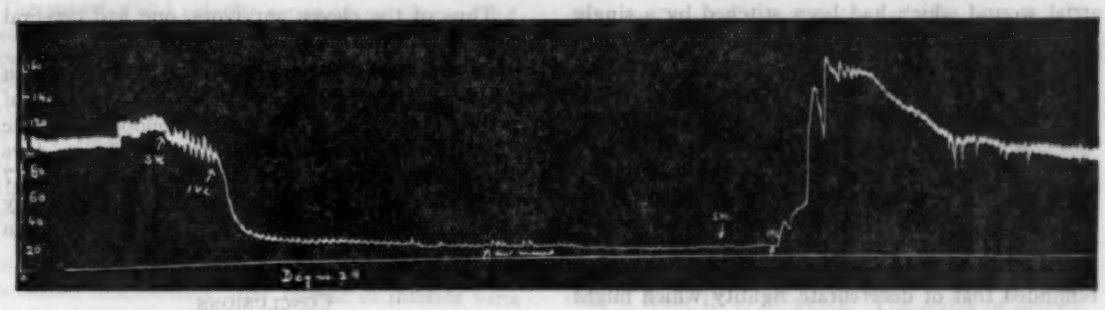

FIG. 3—BLOOD PRESSURE CURVE AS OBTANED IN DOG : 29 DURING THE OPERATION. AT S.V.C. AND I.V.C. ON THE LEFT HAND SIDE THE RESPECTIVE VEINS WERE OCCLUDED. SIMILAR SIGNS ON THE RIGHT HAND SIDE OF THE CURVE INDICATE THE MOMENT WHEN THE VEIN CONCERNED WAS RELEASED.

Fibrillation—Ventricular fibrillation did not occur frequently in this study. It occurred only in three cases. In one case (Dog : 24), ventricular fibrillation followed cardiac massage performed to revive a ballooned heart. In the second case (Dog : 47), it followed the churning of air in the cardiac chambers and was in all probability due to air embolism in the coronary arteries. In the third case (Dog : 49) ventricular fibrillation followed the release of inferior vena cava.

Auricular fibrillation was observed more frequently but it resolved itself spontaneously. Sometimes it led to asystole of the atrium and was on two occasions followed by ventricular fibrillation.

E.C.G.—Electrocardiogram was recorded in five cases. No significant changes were observed during the period of occlusion.

Blood pressure—Blood pressure was recorded in five cases. The femoral artery was exposed below the inguinal ligament and an arterial canula was passed into it. The canula was connected to a mercury manometer from which a pointer registered the changes on a moving drum. The blood pressure tracings in all cases were similar. Fig. 3 shows the blood pressure tracings in Dog : 29. The normal blood pressure in this dog ranged between 100 and 110 mm. of mercury. On occlusion of superior vena cava there was a small gradual fall in blood pressure while the occlusion of inferior vena cava resulted in a sudden and marked fall. During the period of occlusion the blood pressure was maintained at a low level of 5 to 7 mm. The oscillations caused by individual ventricular contractions were just visible. The incision of right atrium did not produce any change in the graph. At the end of the occlusion period when the superior vena cava was released there was little if any change in the blood pressure. The release of inferior vena cava, however, caused a sudden rise of blood pressure, the rise being higher than the initial level. In the graph shown (Fig. 3) the inferior vena cava was released gradually.

Air embolism—Air embolism is a real risk in open cardiac surgery. The method usually employed to expel the air out of the cardiac chambers is to fill them rapidly with saline and immediately apply a clamp to close the incision which is then stiched leisurely. The same method was tried in this study in the first two experiments, but it was observed that the saline disappeared from the atrium as soon as it was poured in. Subsequently the following method was devised and practised. The stitching of the atrial incision was commenced at the lower end without filling the atrium with saline. While the uppermost part of the atrial incision was still unstitched the superior vena cava was released. Blood from the superior vena cava filled the atrium expelling the air out through the uppermost unstitched part of atrial incision which was kept widely open for the purpose. A small amount of blood was also allowed to escape to ensure complete elimination of air. The method gave satisfactory result. However in one case (Dog : 47), due to inco-ordination in the release of the veins and stitching of the atrial incision some air managed to remain behind and the churning sound produced by its presence could be heard. Ventricular fibrillation developed and the animal died in a few moments.

MORTALITY

Of the seventeen dogs operated six animals, i.e., a little more than a third died as a result of the operation. The first death (Dog : 16) occurred a little while after the chest had been closed following a successful operation. Postmortem examination of this animal showed a moderate amount of blood in the pericardium and that was the likely cause of its death. The blood had been leaking out from in between the stitches of the

atrial wound which had been stitched by a single layer of interrupted sutures. After this accident a layer of continuous sutures was applied over the first layer. Another death (Dog : 38) occurred fortyeight hours after the operation. This animal never gained consciousness after the operation. Next morning also it was found lying unconscious, both the hind legs and the forelimbs were rigid and so were its tail and neck. The jaw was clenched. It remained in this unconscious and stiff state for 48 hours and died. The condition reminded that of decerebrate rigidity which might have occurred as a result of neuronal damage due to occlusion of circulation beyond the limits of toleration, or it might have been due to air embolism. The brain was removed at post-mortem but no abnormality was found on naked eye examination. Histological examination of the suspicious areas in the midbrain and pons showed no abnormality.

The remaining four deaths occurred on the table during the operation at a stage when the intracardiac procedure had been completed and the inferior vena cava was released for restoration of circulation. A series of events followed which have been grouped under the term 'ballooning' and have been discussed in the preceeding paragraphs. Thus ballooning was the major cause of death on the table. In Dog 47 air embolism was a major factor for its death.

Survivals

The remaining eleven dogs survived for a greater or lesser period. Three of them (Dogs : 12, 13, 17) died in the laboratory 38, 36 and 21 days respectively after the operation. Their post-mortem examination showed accumulation of seropurulent fluid in the pleural cavity on the operated side. The death was apparently due to infection. Another two animals (Dogs : 25 and 27) were sacrificed 15 days and 33 days after the operation due to lack of space. No detectable signs of abnormality were found on post-mortem examination. The rest of the animals were released 21 to 44 days after their operation.

All the surviving animals appeared normal physically and mentally except one (Dog : 17) who developed paralysis and spasticity of the hind legs. It was never seen to stand up nor did it respond to sound. Occasionally it picked up the right ear but never the left. It could see since there was a response when food was kept nearby. It never barked after the operation. It developed diarrhoea three weeks after the operation and died. Post-mortem examination showed seropurulent material in its pleural cavity.

Thus of the eleven survivors, one had cerebral lesion and three died due to infection.

Cerebral lesions—From the preceding discussion it will be observed that two cases had evidence of cerebral damage. Dog : 38 developed a state similar to decerebrate rigidity and died two days after the operation in that condition, and Dog : 17 developed paralysis, loss of hearing and inability to bark. In this animal the occlusion of circulation had been prolonged to 15 minutes.

Conclusions

It is apparent from this study that intracardiac operations are possible at normal temperature. The occlusion of superior and inferior venae cavae is safe for about ten minutes provided blood from the azygos vein is allowed to flow into the heart. The field of operation inside the heart is not completely dry because the blood is constantly flowing in from azygos vein and coronary sinus. However the various landmarks in the right atrium can be visualised momentarily and palpation gives additional information. The loss of blood from the heart is very small. The technique can be employed for intra-atrial operations like stitching of septal defects and tricuspid valvotomy. Incision or dilatation of pulmonary valve through the right ventricle is another field where the procedure can be adopted.

The main risk of the technique is the ballooning of the heart which occurs after the release of inferior vena cava. Out of the six deaths which occurred in this series four were due to this complication. The ballooning seems to be dependant on two factors : one due to sudden rush of blood from the inferior vena cava, and the other due to deficient oxygenation of blood during the period of occlusion of circulation. The complication can be minimised by gradual release of inferior vena cava and full inflation of the lungs. However, the subject needs further investigation. The occurrence of cerebral lesion is another drawback of the procedure. It occurred in two cases in this series. The cerebral lesions can definitely be minimised if the period of occlusion of the veins is kept below 10 minutes, but it is likely to remain a small hazard of this technique. Ventricular fibrillation was not a serious complication and did not appear to be much of a problem under the conditions of the experiment.

Summary

An experimental study was undertaken on dogs to assess the possibility of intracardiac operations under direct vision at normal temperature.

The superior and inferior venae cavae were occluded for ten to fifteen minutes. The blood from azygos vein was, however, allowed to flow into the heart. Seventeen operations were performed under these conditions. In fourteen the right atrium was widely incised, blood in it was sucked out and it was explored with finger. In three cases the right ventricle was opened and the orifice of the pulmonary trunk was dilated.

Of the 17 animals five died on the table, four of them due to 'ballooning' of the heart which occurred immediately after release of inferior vena cava. One animal died two days later with signs like those of decerebrate rigidity. Eleven dogs survived, one of them showed signs of cerebral damage while the rest were normal physically and mentally.

Ventricular fibrillation was not a hazard at normal temperature. Observations on behaviour of heart and blood pressure are recorded and a new method of expelling air out of the cardiac chambers before stitching has been described.

ACKNOWLEDGMENTS

This work was conducted at the laboratory of the Surgery Department, K. G. Medical College, Lucknow, under a financial grant received from the Government of U.P. The help given by the following is gratefully acknowledged: Dr. R. P. Bajpai and Dr. M. N. Khanna for assistance in operation; Dr. S. R. Kapor, Reader in Physiology for blood pressure and electrocardiogram records and Dr. K. M. Wahal, neuro-pathologist, for histological examination of the brain.

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AGE OF EPIPHYSEAL UNION AT THE WRIST JOINT IN UTTAR PRADESH*

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INTRODUCTION

A study of the work of various authorities shows considerable discrepancy regarding the age at which the distal ends of the radius and the ulna fuse with their respective shafts. From the work done in India it appears that the time of union of these epiphyses is different even in different provinces of the country. In Uttar Pradesh work was done in the past on a limited number of cases by Lall and Nat (1934) on 42 boys, Lall and Townsend (1939) on 125 girls and Mittal (1952-53) on 125 boys and 125 girls. The present survey was taken up under the auspices of the Department of Forensic Medicine, Lucknow University, and consisted of a study of 400 healthy subjects (200 boys and 200 girls) of Uttar Pradesh whose age ranged from 15 to 22 years. The series of investigations carried out were conducted with a view to determine, if possible, with more accuracy than hitherto done, the majority ages of union of the distal epiphyses of the radius and the ulna with their shafts in the residents of Uttar Pradesh, and to compare these figures with those of other races and also of the people of different provinces of India, so as to provide the medicolegist with reliable figures for both sexes, more especially applicable to the residents of Uttar Pradesh, in the many medicolegal cases where the question of age frequently crops up, when the date of birth is unknown; also to ascertain whether the commonly accepted idea as to the earlier maturity of Indians, as compared to Europeans, generally found any support in a possible earlier union of the epiphyses.

The observation of the epiphyseal changes in a radiogram should, however, be regarded as a supplement to and not as a substitute for other important data and methods like eruption of teeth, height, weight, the changes occurring due to onset of puberty and general development etc., because no individual available technique is entirely adequate for assessing the correct age.

METHOD AND MATERIAL

The project got under way in November 1952 at Dehra Dun where 122 boys and 61 girls were investigated, and terminated in October 1954 at Lucknow where 78 boys and 139 girls were examined.

The subjects belonged to different economical and educational status and various religious groups.

Only such cases were selected for study in whom the date of birth correct to the day was authentically available.

These 400 healthy boys and girls were subjected to clinical and radiological study. The composite series was divided into two sub-series, one for the females (serially numbered from 1 to 200) and the other for the males (serially numbered

* Concised from a thesis accepted for the award of M.D. of Lucknow University.

from 1 to 200). The ages of the subjects examined were between 15 and 22 years. All the cases in both male and female series were divided into seven age-groups, namely, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21 and 21-22 years and in each group of each sex there were 5, 30, 40, 50, 40, 30 and 5 cases respectively thus making up a total of 200 cases for each sex.

The period of residence in Uttar Pradesh and ages correct to days of each subject were noted. Their height and weight were recorded and teeth counted. The general health and constitution were observed. Other information regarding religion, caste, guardian's profession, staple diet, habits, history of any previous illness, occupation, economic condition and family history were also obtained.

Both the wrists were then x-rayed in every case and the following points were carefully noted with reference to each epiphysis in both sexes separately:

1. Youngest subject in whom the epiphysis was found to be fused with its diaphysis.

2. Oldest subject in whom epiphysis had not fused.

3. The range of fusion with relation to each epiphysis, covering the upper and lower ages.

4. Average or majority age when epiphysis fused in majority of cases, i.e., in more than 75 per cent of cases.

Observations and Findings on the Epiphyseal Union of Distal Epiphysis of Radius (Tables 1 and 2)

The earliest age of union of the distal epiphysis of radius with the shaft was observed in a boy aged 17 years 2 months and 12 days and a girl aged 15 years 9 months and 13 days.

The process of union did not commence earlier than 15 years 7 months and 22 days in the boys examined but had commenced in all the girls examined, the youngest girl showing commencement of fusion was aged 15 years and 1 month.

The oldest subjects in whom union had not taken place were a boy aged 21 years 6 months

Table 1—Showing Union of the Distal Epiphysis of Radius with the Shaft in 200 Males

Age-group (years)	No. of boys examined	No. of non-union	No. of union commenced	No. of incomplete union	Complete union					
					1st quarter	2nd quarter	3rd quarter	4th quarter	Total	Percentage
15—16 ...	5	3	2	—	—	—	—	—	—	—
16—17 ...	30	—	15	15	—	—	—	—	—	—
17—18 ...	40	1	4	26	1	4	2	2	9	22·5
18—19 ...	50	—	1	28	2	3	10	6	21	42·0
19—20 ...	40	—	—	15	6	3	9	7	25	62·5
20—21 ...	30	—	—	7	7	6	6	4	23	76·6*
21—22 ...	5	—	—	1	1	—	3	—	4	80·0

* 95·8 per cent if Garhwalis were excluded from this age-group.

Table 2—Showing Union of the Distal Epiphysis of Radius with the Shaft in 200 Females

Age-group (years)	No. of girls examined	No. of non-union	No. of union commenced	No. of incomplete union	Complete union					
					1st quarter	2nd quarter	3rd quarter	4th quarter	Total	Percentage
15—16 ...	5	—	3	1	—	—	—	1	1	20·0
16—17 ...	30	—	1	19	—	2	4	4	10	33·3
17—18 ...	40	—	1	22	4	1	5	7	17	42·5
18—19 ...	50	—	—	8	8	6	10	18	42	84·0
19—20 ...	40	—	—	3	13	9	8	7	37	92·5
20—21 ...	30	—	—	—	6	13	5	6	30	100·0
21—22 ...	5	—	—	—	3	—	—	2	5	100·0

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and 6 days and a girl aged 19 years 8 months and 11 days.

The range of union is from 17·20 to 21·51 years in boys and 15·78 to 19·69 years in girls and the age-group showing complete union in more than 75 per cent of cases, i.e., the majority age of union, is 20-21 years in males, union occurring in 76·6 per cent of the cases, and 18-19 years in females, union occuring in 84 per cent of the cases.

From an analysis of the cases showing complete union in each quarter of the different age-groups, it is found that the majority age of union appears to be more or less spread over throughout the age-group 20-21 years in the males and 18-19 years in the females, though the maximum cases are in the first quarter in the former and in the last quarter in the latter.

A comparative study of union of distal epiphysis of radius—Lall and Nat (1934) observed that in the boys of Uttar Pradesh of age between 16-17 years, union occurred in 40 per cent of the cases and in the age-group 18-19 years it was seen in 73 per cent of the cases ; the corresponding figures of the present work are 0 per cent for 16-17 years, and 42·0 per cent for 18-19 years. Their conclusion for majority age of union is 19 years as compared to 20-21 years of the present work.

Lall and Townsend (1939) working on the females of Uttar Pradesh found that the union was seen from the age of 14 to 19 years, but 13 out of 20 cases were united between 17 and 18 years. Their conclusion for majority age of fusion is 19 years, as compared to 18-19 years of the present work.

Mittal (1952) observed the earliest fusion between 16 and 17 years in both boys and girls, as compared to 17 years 2 months and 12 days in boys and 15 years 9 months and 13 days in girls in the present work. The epiphysis was found fused in the age-group 17-18 in 28 per cent of boys and 71 per cent of girls ; the corresponding figures for the present work are 22·5 per cent and 42·5 per cent showing a marked difference. All the girls according to him showed union about the age of 18 years, while in the present work the oldest female in whom the fusion was incomplete was aged 19 years 8 months and 11 days. He found that in the age-group 18-19 years union was complete in only 40 per cent of boys which was nearer to the corresponding finding (42 per cent) of the present work. The range of fusion observed by him was inconclusive in males and 16-19 years in females ; the present work shows this as 17·20 to 21·51 years in males and 15·78 to 19·69 years in females.

The number of cases examined by him in the age-group 18-19 was too small to give a reliable percentage. He examined only 5 boys and 3 girls in this group as compared to 50 boys and 50 girls examined in the present work. He did not investigate cases beyond this age-group while in the present work 40, 30 and 5 cases each were separately investigated also in the age-groups 19-20, 20-21 and 21-22 years respectively.

Observations and Findings on the Epiphyseal Union of Distal Epiphysis of Ulna
(Tables 3 and 4)

The process of union did not commence earlier than 15 years 7 months and 22 days in the boys and 15 years 4 months and 8 days in the girls that were examined. The earliest age of fusion of the distal epiphysis of ulna to the shaft was observed in a boy aged 16 years 2 months and 19 days and in a girl aged 15 years 9 months and 13 days. The oldest subjects in whom fusion had not taken place were a boy aged 21 years 6 months and 6

Table 3—Showing Union of the Distal Epiphysis of Ulna with Shaft (in 200 Males)

Age-group (years)	No. of boys examined	No. of non-union	No. of union commenced	No. of incomplete union	Complete union					
					1st quarter	2nd quarter	3rd quarter	4th quarter	Total	Percentage
15—16 ...	5	3	2	—	—	—	—	—	—	—
16—17 ...	30	—	15	14	1	—	—	—	1	3·3
17—18 ...	40	2	2	21	2	6	2	5	15	37·5
18—19 ...	50	—	1	22	3	6	11	7	27	54·0
19—20 ...	40	—	—	13	7	4	9	7	27	67·5
20—21 ...	30	1	—	5	7	6	7	4	24	80·0*
21—22 ...	5	—	—	1	1	—	3	—	4	80·0

* 100 per cent if Garhwalis were excluded from this age-group.

TABLE 4—SHOWING UNION OF THE DISTAL EPIPHYSIS OF ULNA WITH SHAFT (IN 200 FEMALES)

Age-group (years)	No. of girls examined	No. of non-union	No. of union commenced	No. of incomplete union	COMPLETE UNION					
					1st quarter	2nd quarter	3rd quarter	4th quarter	Total	Percentage
15—16 ...	5	1	2	1	—	—	—	1	1	20·0
16—17 ...	30	—	1	12	—	3	7	7	17	56·6
17—18 ...	40	—	—	13	4	2	8	13	27	67·5
18—19 ...	50	—	—	1	11	6	13	19	49	98·0
19—20 ...	40	—	—	1	13	9	9	8	39	97·5
20—21 ...	30	—	—	—	6	13	5	6	30	100·0
21—22 ...	5	—	—	—	3	—	—	2	5	100·0

TABLE 5—SHOWING A COMPARATIVE STUDY OF THE AGES OF UNION OF DISTAL EPIPHYSES OF RADIUS AND ULNA

Author	BOYS			GIRLS		
	No. examined	Average age of union		No. examined	Average age of union	
		Radius	Ulna		Radius	Ulna
Lall & Nat (1934) ...	52	19	19	—	—	—
Lall & Townsend (1939) ...	—	—	—	125	19	19
Mittal (1952)	125	Inconclusive	Inconclusive	125	18	17-18
Present work	200	20-21 (76·6% cases of union)	20-21 (80% cases of union)	200	18-19 (84% cases of union)	18-19 (98% cases of union)

days and a girl aged 19 years 1 month and 21 days. The range of fusion is from 16·21 to 21·51 years in boys and from 15·78 to 19·14 years in girls. The age-group showing complete union in more than 75 per cent of cases, i.e., the majority age of union, is 20-21 years in males, union occurring in 80 per cent of the cases, and 18-19 years in females, union occurring in 98 per cent of the cases.

From an analysis of the cases showing complete union in each quarter of the different age-groups, it is found that the majority age of fusion appears to be more or less spread over throughout the age-group 20-21 years in males and 18-19 years in females, though the maximum cases are in the first and third quarters in the former and in the last quarter in the latter.

A comparative study of union of distal epiphysis of ulna is depicted in Table 5.

COMPARISON OF THE EPIPHYSEAL UNION OF THE DISTAL ENDS OF RADIUS AND ULNA

Earlier union of distal epiphysis of ulna as compared to the union of distal epiphysis of radius was seen in the present work. Although the majority age of fusion is same, i.e., 20-21 years, for the distal epiphyses of both the bones, the fusion of the distal epiphysis of ulna is earlier by a few months to a year than the distal epiphysis of radius (Fig. 1).

RELATION OF EPIPHYSEAL UNION TO OTHER FACTORS

Racial differences—A comparative study of the age of epiphyseal union of distal ends of radius and ulna as observed by various authors shows that union in Indians, especially Bengalees, South Indians and Punjabis, takes place considerably earlier than in any other race. But the findings during the present investigation show that although union of epiphyses in subjects of Uttar Pradesh occurs earlier than in English people it takes place either at the same age or a little later than in other countries like America, Australia, Egypt and Burma, as would be evident from Table 6.

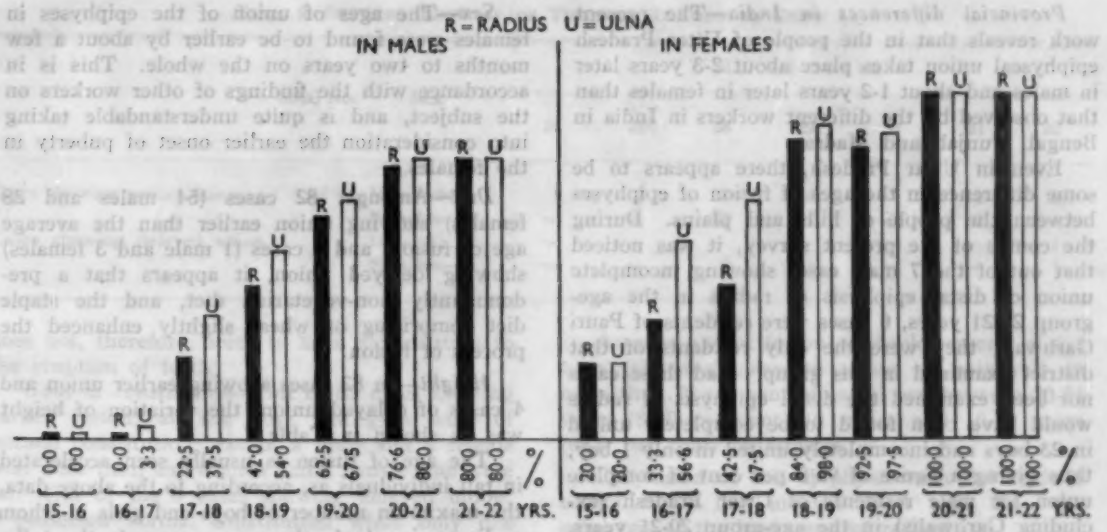

FIG. 1—SHOWING A COMPARATIVE STUDY OF THE AGES OF UNION OF DISTAL EPIPHYSES OF RADIUS AND ULNA.

TABLE 6—SHOWING THE AVERAGE AGES OF UNION OF THE DISTAL EPIPHYSES OF RADIUS AND ULNA ACCORDING TO VARIOUS AUTHORS

Authors	Subjects	RADIUS			ULNA		
		Males	Females	Mixed	Males	Females	Mixed
1. Pryor	American	20	19	—	19	16	—
2. Greulich & Pyle ...	„	Beyond 18	17	—	18	17	—
3. Davies & Parsons ...	English	—	—	19-20	—	—	20
4. Paterson		21	20	—	21	20	—
5. Flecker	Australian	19	18	—	19	17	—
6. Sidhom & Derry ...	Egyptian	19-20	—	—	19-20	—	—
7. Barrett	Burmese	—	17	—	—	17	—
8. Hepworth	Indian—Punjab	—	—	16-17	—	—	16-17
9. Galstaun	Indian—Bengal	18	16-17	—	18	17	—
10. Basu & Basu ...	„ „	—	16-17	—	—	16-17	—
11. Pillai	Indian—S. India	—	—	18	—	—	18
12. Lall & Nat	Indian—U. P.	19	—	—	19	—	—
13. Lall & Townsend ...	„ „	—	19	—	—	19	—
14. Mittal	„ „	Inconclusive	18	—	Inconclusive	17-18	—
15. Present work ...	„ „	20-21	18-19	—	20-21	18-19	—
Other authors :							
1. Smith & Fiddes ...	European	—	—	20	—	—	19
2. Gray	„	—	—	about 20th	—	—	About 20th
3. Cunningham ...	„	21	19-20	—	21	19-20	—
4. Quain	„	—	—	18th-20th	—	—	18-20th
5. Holms & Ruggles ...	„	—	—	20	—	—	18
6. Frazer	„	—	—	22	—	—	20
7. Scudder	„	—	—	19-20	—	—	—
8. Poland	„	—	—	19-23	—	—	18-20
9. Morris	„	—	—	20	—	—	20
10. Cohn	„	—	—	20-21	—	—	20-21

Provincial differences in India—The present work reveals that in the people of Uttar Pradesh epiphyseal union takes place about 2-3 years later in males and about 1-2 years later in females than that observed by the different workers in India in Bengal, Punjab and Madras.

Even in Uttar Pradesh, there appears to be some difference in the ages of fusion of epiphyses between the people of hills and plains. During the course of the present survey, it was noticed that out of the 7 male cases showing incomplete union of distal epiphysis of radius in the age-group 20-21 years, 6 cases were residents of Pauri Garhwal; they were the only residents of that district examined in this group. Had these cases not been examined the distal epiphysis of radius would have been found to be completely united in 23 boys and incompletely united in only 1 boy, thus giving a figure of 95·8 per cent of complete union for male residents of Uttar Pradesh (excluding Garhwalis) in the age-group 20-21 years. Similarly, all the 5 male cases showing incomplete union and a case of non-union of distal epiphysis of ulna in the age-group 20-21 years were residents of Pauri Garhwal, they being the only residents of that district examined in this group. If these cases were excluded distal epiphysis of ulna would have been found to have completely fused in 24 boys, thus giving a figure of 100 per cent of complete union for male residents of Uttar Pradesh (excluding Garhwalis) in the age-group 20-21 years. The number of Garhwalis examined was too small to form a definite opinion on this point.

Religion and caste—No difference of any appreciable extent was seen in the process of union of epiphyses in the present work as also in those observed by Galstaun and Mittal, in people of different religion or caste. Although the number of Anglo-Indians examined was limited, yet none of these cases were found to be ahead of others in the process of fusion, as opposed to the observation of Mittal in this respect.

Sex—The ages of union of the epiphyses in females were found to be earlier by about a few months to two years on the whole. This is in accordance with the findings of other workers on the subject, and is quite understandable taking into consideration the earlier onset of puberty in the females.

Diet—Amongst 82 cases (54 males and 28 females) showing union earlier than the average age of fusion, and 4 cases (1 male and 3 females) showing delayed union, it appears that a predominantly non-vegetarian diet, and the staple diet comprising of wheat slightly enhanced the process of fusion.

Height—In 82 cases showing earlier union and 4 cases of delayed union, the variation of height was as shown in Table 7.

The age of fusion is usually seen accelerated in tall individuals as, according to the above data, the maximum number of boys and girls in whom earlier union took place were towards the taller side. This confirms the statement of Le Gros Clark and Mittal.

Weight—The weights of 82 cases showing earlier union had very wide variations ranging from 76 to 135 lb. in females, and from 90 to 162 lb. in males. In 4 cases showing delayed union, the females had weights varying from 70 to 100 lb. and the male case weighed 120 lb. The individual's body weight, therefore, does not seem to influence the process of fusion, which is in accordance with Mittal's but unlike Wallis's findings.

Teeth—Amongst 82 cases showing earlier union and 4 cases of delayed union the number of teeth erupted was as shown in Table 8.

From the figures shown in Table 8, it appears that no advancement in the eruption of teeth was seen with relation to early fusion of the epiphyses, as the majority of these cases had 28 teeth; nor is it possible to co-relate delayed union of epiphyses with the eruption of teeth as half of such cases had 32 teeth. The epiphyseal union

TABLE 7—SHOWING HEIGHT IN FEET IN RELATION TO UNION

	Total No.	Sex	Height in feet					
			4½ to 4¾	4¾ to 5	5 to 5¼	5¼ to 5½	5½ to 5¾	5¾ to 6
Cases showing earlier union ...	82	Males—54	1	—	11	33	6	3
		Females—28	1	12	15	—	—	—
Cases showing delayed union	4	Male—1	—	—	—	—	—	1
		Females—3	2	1	—	—	—	—

TABLE 8—SHOWING ERUPTION OF TEETH IN RELATION TO UNION

	Total No.	Sex	No. of teeth						
			24	27	28	29	30	31	32
Cases showing earlier union ...	82	Males—54	1	1	32	2	7	2	9
		Females—28	—	—	22	4	—	2	—
Cases showing delayed union	4	Male—1	—	—	—	—	—	—	1
		Females—3	—	—	2	—	—	—	1

does not, therefore, seem to have any relation to the eruption of teeth.

General constitution—Out of 82 cases showing earlier fusion, all the boys and girls were of normal constitution, except a male and a female who were thin, and a male and a female who were fat. Out of the 4 cases showing delayed union, 3 possessed normal constitution while only one was of thin build. It shows that an individual's constitution has no relation to the age of epiphyseal union.

Previous illness—Out of 82 cases of earlier union, 11 gave past history of typhoid fever, 3 of pneumonia, 1 of pleurisy, 1 of asthma, 1 of night blindness and 1 of fracture. Out of the 4 cases of delayed union, 2 suffered from typhoid fever in the past. It appears therefore that the epiphyseal union did not show variations due to previous minor ailments.

Activity—Out of 82 cases showing earlier fusion 73 were active and 9 moderately active. Out of the 4 cases showing delayed fusion of epiphyses, 2 were active and 2 moderately active. It seems that the process of fusion was usually quicker in the active rather than in the moderately-active or non-active.

Economic condition—Out of 82 cases who showed earlier fusion of the epiphyses, 20 belonged to the poor class, 33 to the fairly well-to-do (or the so-called middle) class, and 29 to very well-to-do (or the richer) class. All the 4 cases who showed delayed union of the epiphyses belonged to the middle class. It appears, therefore, that there is no relation of the economic condition to the age of fusion of epiphyses, as opposed to Schinz, Baensch and Friedl (1928—quoted by Paterson, 1929).

SUMMARY

Average age of fusion of the lower end of the radius (showing complete union of epiphysis in more than 75 per cent cases) was between 20-21 years (76·6 per cent) in males and 18-19 years (84·0 per cent) in females.

Average age of fusion of the lower end of the ulna (showing complete union of epiphysis in more than 75 per cent of cases) was between 20-21 years (80·0 per cent) in males and 18-19 years (98·0 per cent) in females.

The fusion of this epiphysis with the shaft is earlier by a few months to a year than the epiphysis of the lower end of radius.

When compared to other countries epiphyseal union in boys and girls of Uttar Pradesh takes place earlier than in English subjects but slightly later than that occurring in America, Australia, Egypt and Burma. In the people of Uttar Pradesh, epiphyseal union occurs at a slightly later period than in other provinces of India.

Females are ahead of males by about a few months to two years in the process of epiphyseal union.

Acceleration in the process of epiphyseal union does not show corresponding acceleration in the eruption of teeth.

ACKNOWLEDGMENTS

I am indebted to Dr. C. P. Tandon, Inspector General of Prisons, U.P. (then Head of the Department of Forensic Medicine, Lucknow University) under whose kind supervision and constant able guidance this work had the opportunity to develop. My thanks are also due to the authorities of Lucknow University and Dr. K. M. Lal, Director of Medical and Health Services, U.P., for according me permission to publish this research work; and to Dr. P. D. Srivastava, Additional Director of Medical and Health Services, U.P. (then Civil Surgeon, Dehra Dun) who always helped me with his valuable advice while I was investigating my cases at Dehra Dun.

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CHOLINE THEOPHYLLINATE IN THE RELIEF OF DYSPNOEA

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Respiratory difficulty is one of the common disabilities requiring prompt measures for its alleviation. In bronchial asthma and in some cases of emphysema with chronic bronchitis, relief of dyspnoea may be an urgent problem. Dyspnoea is also an important symptom in congestive cardiac failure particularly in left heart failure. Certain theophylline-containing drugs have long been used in the above-mentioned conditions, but the use of such drugs has so far been limited by the fact that they are therapeutically most effective when given intravenously.

Turner-Warwick (1957) studied theophylline plasma levels in five groups of cases after a single oral dose of five different theophylline compounds of equivalent theophylline content (0·47 g. of theophylline) and found highest theophylline plasma level in subjects receiving choline theophyllinate and aminophylline. He found that the minimum plasma theophylline level that was required for the relief of bronchospasm was 1 mg. per 100 ml. Gandevia *et al* (1957) in a comparative study on the bronchodilator effects of aminophylline suppository (gr. 4 each three times daily), theodrox (one tablet thrice daily orally, each tablet containing aminophylline gr. 3), choline theophyllinate (200 mg. thrice daily orally) and isoprenaline (10 mg. thrice daily sublingually) in patients attending the out-patients' department found most favourable response with choline theophyllinate and aminophylline suppository.

The present investigation was carried out to ascertain the efficacy of choline theophyllinate, a new theophylline-containing compound, in the relief of dyspnoea which was a prominent symptom in certain clinical conditions.

Material and Methods

The work was carried out in the department of medicine of Nilratan Sircar Medical College, Calcutta. Fifty patients were taken up for investigation, of whom 35 were males and 15 females. Age distribution of the patients varied between 4 and 75 years. The diseases from which the patients suffered were as follows: Bronchial asthma 18, emphysema with chronic bronchitis 20, hypertensive congestive cardiac failure 5, Kimmelstiel-Wilson syndrome 1, rheumatic valvular disease with congestive cardiac failure 3, anaemic cardiac failure 1, ischaemic congestive cardiac failure 1 and tropical eosinophilia 1.

The following routine investigations were carried out: Blood count, erythrocyte sedimentation rate, circulation time (decholin time and ether time), venous pressure, skiagram of the chest and electrocardiogram.

Dyspnoea was the prominent presenting symptom in all the cases. Choline theophyllinate was started in every case immediately after admission. The dosage employed varied between 200 mg. thrice daily and 400 mg. four times daily. Clinical improvement was assessed from relief of subjective symptom of dyspnoea and disappearance of evidences of bronchospasm or congestive cardiac failure. Clinical response of the patients were divided into the following four grades:

Good—There was prompt relief of dyspnoea and the patient remained asymptomatic during choline theophyllinate therapy.

Fair—Though the patient could be kept asymptomatic with choline theophyllinate, there were one or more recurrences of the attacks of dyspnoea during therapy.

Slight—There was slight clinical improvement but the patient was not free from dyspnoea.

No response.

Apart from administration of choline theophyllinate, appropriate treatment was given to individual cases, e.g., antibiotics for infection; salt restricted diet, digitalis and mercurial diuretics for congestive cardiac failure. The patients were followed up for a period of one to sixteen weeks.

Result

Each of the 18 patients of bronchial asthma had already tried several remedies outside, and having failed to obtain relief from dyspnoea was admitted into the hospital. Of these, 12 patients were in the condition of status asthmaticus. In ten of them an initial dose of 800 mg. of choline theophyllinate was given orally. The patients were observed for one hour. In only two cases there was definite relief of dyspnoea, while in the remaining cases there was no change in the clinical condition and subcutaneous injection of 1 ml. (1 in 1000) adrenaline had to be given. Choline

theophyllinate was then continued. The overall result of choline theophyllinate in the cases of bronchial asthma was good in 12 cases and fair in 6. In the former group, all the patients remained asymptomatic during the period of observation. In the latter group there were one to three recurrences of asthmatic paroxysms requiring adrenaline injections, while in between the paroxysms, the patients remained asymptomatic. Initially choline theophyllinate was given in a dosage of 200 mg. thrice daily, but it was found to be inadequate. Later, the dosage adopted was as follows: During the stage of acute dyspnoea 800 mg. stat, followed by 400 mg. six hourly; after the dyspnoea was controlled, the dosage was progressively reduced to 200 mg. thrice daily. The tablets were always given after a meal.

Of the 20 cases of emphysema with chronic bronchitis response to choline theophyllinate was good in seven cases and fair in seven. All the patients had parenteral penicillin in addition to choline theophyllinate. They remained asymptomatic during the period of observation on maintenance dose of the drug. In the remaining six cases the response was either slight, or nil. These cases had clinical and radiological evidence of gross emphysema and electrocardiographic evidence of right ventricular preponderance.

Ten cases of congestive cardiac failure, who failed to improve inspite of a rigid regime of bed rest, salt restricted diet, digitalis and mercurial diuretic, were given choline theophyllinate in addition. Response was good in only two cases, the clinical evidence of congestive failure disappeared and the patients were able to move about without discomfort. In six cases there was some improvement of congestive cardiac failure and dyspnoea, while in two cases there was no response. The dosage employed was 400 mg. thrice daily in each case.

In one case of tropical eosinophilia (absolute eosinophil count 6,144 per c.mm.) choline theophyllinate produced definite improvement of dyspnoea, but a subsequent course of Hetrazan was necessary for complete relief.

In one case of Kimmelstiel-Wilson syndrome with bronchospasm and orthopnoea, there was no response to choline theophyllinate.

Side-effects were observed in 8 cases, consisting of anorexia, nausea, vomiting and headache. In 5 of them the symptoms were temporary occurring during the initial few days of therapy and disappeared with persistence with the drug and ensuring that the drug was taken after meals. In the remaining three patients, the drug had to be stopped for unpleasant side-effects.

Discussion

The results of the treatment of cases of bronchial asthma with oral choline theophyllinate indicate that the drug is an efficient bronchodilator. All the cases of bronchial asthma got relief with choline theophyllinate. But, for the immediate relief of severe dyspnoea in cases in status asthmaticus, even massive doses of choline theophyllinate (800 mg.) was found to be ineffective and a more potent bronchodilator drug, e.g., adrenaline had to be given. Subsequent continuation of the drug either abolished or definitely reduced the recurrences of asthmatic paroxysms in every case. The drug could be administered orally in adequate dosage and over prolonged periods in the majority of patients without producing unpleasant side-effects. Inasmuch as the relief of dyspnoea is concerned in cases of bronchial asthma, choline theophyllinate appears to be a valuable addition to the list of drugs effective in bronchospasm.

In patients suffering from emphysema with chronic bronchitis, choline theophyllinate was found to be effective in relieving dyspnoea in about 70 per cent of cases. The patients with considerable bronchospasm derived maximum benefit from the drug, while those with gross emphysema failed to get substantial relief. The clinical response in this condition, therefore, appears to be chiefly due to the bronchodilator action of the drug.

Of the ten cases of congestive cardiac failure who failed to get complete relief with the usual rigid regime, only two showed definite improvement after the addition of choline theophyllinate. The number of patients studied is too small to draw any definite conclusion regarding the usefulness of the drug in this condition.

In three out of fifty patients treated with oral choline theophyllinate the drug had to be withdrawn due to unpleasant side-effects. In five other cases there were minor side-effects which disappeared with persistence with the drug. Long continued administration of the drug did not produce any adverse effect.

Summary

Choline theophyllinate was administered orally to fifty patients suffering from severe dyspnoea. All the cases of bronchial asthma got substantial relief and definite improvement in dyspnoea was noticed in majority of the cases of emphysema. Cases of bronchial asthma who were in status asthmaticus needed an initial injection of adrenaline for the control of dyspnoea. Continued

administration of choline theophyllinate either prevented recurrences of attacks of dyspnoea or made the number of recurrences less. The period of observation in some of the cases extended to sixteen weeks.

Two cases of congestive cardiac failure who could not be controlled by standard regime, got substantial relief from the addition of choline theophyllinate.

Eight patients complained of anorexia, nausea, vomiting and headache. In three of them the drug could not be continued for these side-effects.

ACKNOWLEDGMENTS

Our thanks are due to Dr. A. K. Dutt Gupta, Principal and Superintendent, Nilratan Sircar Medical College and Hospital, for the permission to report the cases and to Drs. S. Das Gupta, A. K. Bhattacharjee, A. Das and G. Mukherjee, House Physicians, for careful follow up of the cases. Choline theophyllinate (Choledyl) was kindly supplied in sufficient quantity for trial by Messrs. Allen & Hanburys, Ltd.

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LIVER FUNCTION IN URAEMIA

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The activities of the liver cannot be ranged in order of importance to the body as a whole, nor, when the liver is impaired, does their efficiency decrease in any fixed sequence. There is no "best" test of liver function even for any one purpose (Stewart and Dunlop, 1954). Different individuals respond differently to the same test. Therefore the best results are usually obtained by using several tests.

In addition to the acute and chronic liver diseases, certain other diseases, such as malaria and ulcerative colitis (Sherlock, 1955) and amoebiasis (Chitkara and Chuttani, 1956) have been shown to lead to impaired liver function. We were interested whether and how far the biochemical disturbances associated with a state of uraemia were able to upset the working of the liver, but could find few references in the literature on the subject ; hence the present study was undertaken.

MATERIAL AND METHODS

25 cases of uraemia were studied from the surgical and medical wards of the V. J. Hospital, Amritsar. The cases for the study (Table 1) were taken at random but they were scrutinized for any past or present history suggestive of or predisposing to liver disease. The blood urea

TABLE 1—SOME DETAILS OF THE CASES STUDIED

Name (initials)	Diagnosis	Blood urea (mg.%)	Period in hours high blood urea detected	Known duration of symptoms suggestive of present disease
J.R.	Chronic nephritis	220	24	2 months
P.K.	Hypertension	117	24	1½ years
D.D.	Chronic nephritis	115	48	6 months
A.S.	Chronic nephritis	300	24	1½ years
S.D.	Diabetic nephropathy	130	72	6 years
B.	Chronic nephritis with uraemic pericarditis	115	24	2 years
D.S.	Uraemia with pericarditis	200	144	1½ months
H.R.	Chronic nephritis with hypertension	140	48	6 months
M.	Malignant hypertension	130	24	2 months
T.S.	Hypertension	214	24	2 months
K.S.	Diverticulum u. bladder with uraemia	186	72	3 years
P.C.	Intestinal obstruction	126	48	6 days
B.K.	Hypertension	115	144	6 months
M.L.	Chronic nephritis	144	24	20 days
S.R.	Hypertension	140	72	4 years
S.K.	Chronic nephritis	300	24	5 months
S.R.	Malignant hypertension	300	48	10 years
H.C.	Enlarged prostate	120	72	3 years
A.S.	"	130	48	6 months
Sh.	Acute nephritis	95	72	20 days
L.D.	Chronic nephritis	120	48	2 months
B.S.	Chronic nephritis	207	48	3 months
L.S.	Hypertension	164	72	3 months
B.S.	Congestive heart failure	110	96	3 months
M.	Chronic nephritis	130	48	6 months

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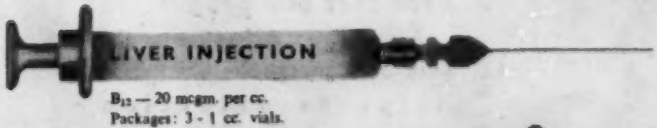

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figures in the group ranged from 95 to 300 mg. per cent. A battery of liver function tests was carried out in each case. The methods followed in carrying out the tests are briefly outlined below:

Van den Bergh's test and serum bilirubin estimation—The van den Bergh's direct reaction was carried out as modified by Godfield (1935). The van den Bergh's indirect reaction and quantitative estimation of bilirubin were done according to the modification by McNee and Keefer (1935). The maximum value taken as normal for serum bilirubin is 1 mg. per cent as suggested by Napier and Das Gupta (1941) for Indian subjects.

Total proteins, serum albumin and serum globulin—Total serum proteins were calculated by subtracting N.P.N. from total serum nitrogen and multiplying the remainder by 6·25. Total serum nitrogen was estimated by the micro-Kjeldahl method. N.P.N. was calculated from blood urea figures according to Harrison (1957).

Globulins were precipitated with 22 per cent sodium sulphate (Howe, 1923). From an aliquot part of the filtrate total albumin nitrogen and N.P.N. were estimated by the micro-Kjeldahl method as described above. N.P.N. was subtracted from this and albumin calculated by multiplying albumin nitrogen by 6·25.

Serum globulin was obtained by subtracting serum albumin from serum total proteins. The normal values according to Harrison (1957) for serum proteins are 5·6 to 8·5 g. per cent, serum albumin 3·4 to 6·7 per cent, serum globulin 1·2 to 2·9 per cent and the A : G ratio 4 : 1 to 1 : 1.

Thymol turbidity and flocculation tests—The thymol turbidity test was carried out as described by Maclagan (1944) with modification of the buffer (at pH 7·55) according to Mateir *et al* (1947). The normal values are 0 to 4 units.

Maclagan's thymol flocculation was done as described by Neefe (1946). The normal is 0 to 2 +.

Cephaline cholesterol flocculation test—This is carried out according to the method of Hanger (1938). The flocculation was noted at the end of 24 and 48 hours.

After 24 hours −ve and ± were taken as normal and + doubtful; while after 48 hours up to 1+ was considered within normal range and 2+ as doubtful, but Harper (1951) gives the normal as 0 to 2+.

Alkaline phosphatase was determined according to the modified method of Bodansky (1937). Normal for adults is taken as 2 to 4·5 B.U. per 100 c.c.

Results

The results are given in Table 2.

Table 2—Showing Results of Various Biochemical Tests Done

	No. of cases	
Serum bilirubin in mg. per cent		
Less than 1	24	
More than 1	1	
Total serum proteins in g. per cent		
7·0 to 7·9	5	
6·0 to 6·9	20	
Serum albumin in g. per cent		
4·0 to 4·9	7	
3·4 to 3·9	15	
Below 3·4	3	
Serum globulin in g. per cent		
2·0 to 2·9	17	
Above 2·9 (abnormal)	8	
Thymol turbidity in units		
0 to 4	25	
Thymol flocculation		
0 to 1+	23	
2+	2	
Alkaline phosphatase		
2—4·5 B.U/100 c.c.	14	
More than 4·5 B.U.	11	
Cephaline cholesterol flocculation	After 24 hours	After 48 hours
−	14	3
±	5	10
+	4	9
++	2	3

Summary

A battery of liver function tests was carried out in 25 cases of uraemia. The studies revealed that the serum bilirubin was raised only to a subicteric level in one case. The total serum proteins were within the normal range, the serum albumin was subnormal in 3 while serum globulin was raised in 8 cases. The thymol turbidity and flocculation tests were within normal limits. Cephaline-cholesterol flocculation tests were normal in 18 and abnormal in 2 cases. In 4 cases the values were doubtful at the end of 24 hours and in the remaining one case the result was doubtful at the end of 24 hours and normal (Harper, 1951) or abnormal (Hawk *et al*, 1954) at the end of 48 hours. The serum alkaline phosphatase was raised in 11 out of 25 cases but then the rise is known to occur in renal disease and therefore may or may not indicate liver dysfunction.

ACKNOWLEDGMENTS

We are grateful to Dr S. S. Anand, Professor of Surgery, Medical College, and Medical Superintendent, V.J. Hospital, Amritsar, for permission to study the surgical cases under him. Our thanks are due to Sh. Kundan Singh, Biochemist, for carrying out the liver functions tests in the Medical College Laboratory.

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A NOTE ON SOME FEEDING TRIALS WITH FOOD YEAST IN UTTAR PRADESH

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AND

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INTRODUCTION

In an earlier communication (Govil, 1954) it was brought out that half an ounce of dried food yeast could be consumed daily per adult person as a supplement to the normal diet by mixing it in *atta, dal,* curried vegetables and Bengal-gram flour when preparing *pakories* etc., without affecting the taste or flavour of the common Indian dishes and without causing any digestive upset. It has also been found that food yeast was an acceptable food and increased the appetite of the subjects, as it is a rich source of proteins of high biological value and vitamins of the B group.

In this study the consumer trials with food yeast were carried out on eighteen adult female students of the Silver Jubilee Health School, Lucknow, and on twentyone adult males in village Thana in Basti district in U.P. The results of these experiments carried out, though on a small scale, were found to be encouraging, and large scale feeding trials in two centres in rural areas were, therefore, undertaken in order to popularise its use in the diet, as well as to find out whether a demand could be created among the masses living in the villages, for food yeast. 1600 lb. of food yeast (*Torula utilis*) was received from the Director General of Health Services, New Delhi, for feeding trials on a more extensive scale on about 50 families for a period of 3-4 months at each of the two rural centres, one in Lucknow and the other in Basti district.

MATERIAL AND METHOD

Thana and Indaurabagh villages in Basti and Lucknow districts respectively were selected for the trials. The feeding trials in Thana village lasted from January 11, 1956 to April 17, 1956 and in Indaurabagh from March 1, 1956 to June 30, 1956. Thana is a small village in Harriya Tehsil hardly about two miles from Tehsil headquarters. It has a population of about 900 consisting mostly of *Kayasthas* and labourers. Indaurabagh is also a small village about 13 miles away from Lucknow situated next to the Extension-cum-Training Centre, Bakshi-ka-Talab. It is inhabitated by about 300 persons consisting mostly of agriculturists and labourers. Both these centres were located in such areas where people are generally malnourished.

In Thana village, the scheme was supervised by the Sanitary Inspector under the direction of the District Medical Officer of Health, Basti. The villagers who had already experienced the beneficial effect of food yeast in the previous trial offered valuable co-operation in convincing the people to use food yeast. This village was selected with a view to exercise better supervision because of its nearness to the Extension-cum-Training Centre, Bakshi-ka-Talab. One of the Sanitary Inspectors of the staff and a Village Level Worker were deputed to supervise day-to-day working of the scheme. Monthly visits were also made by the Nutrition Survey Officer to supervise the scheme.

In Thana, 46 families comprising of 166 persons (49 adult males, 53 adult females and 64 children —infants excluded) joined the feeding trial. In Indaurabagh only 30 families comprising of 75 persons (41 adult males, 22 adult females and 12 children—excluding infants) joined the trial. They were all clinically examined before and after the feeding trials were over, according to rapid survey schedule of the Nutrition Advisory Committee of the Indian Council of Medical Research. Their normal dietary intake was also recorded.

A weekly supply of food yeast was made to each family according to the number of persons in the family. Feeding was started with one teaspoonful (⅓ oz.) of food yeast per head per day and gradually increased by a teaspoonful at intervals of ten days till the quantity consumed was four teaspoonfuls (⅓ oz.) per head per day which was continued till the trial lasted. The quantity of food yeast was equally divided between two principal meals and mixed with *atta, dal,* curried vegetables and in Bengal gram flour when preparing *pakouries*.

The acceptability was judged from the percentage of people under feeding trials who continued using food yeast during the entire period of the trials and thus had accepted it as a supplement in their diets. In Thana village out of 46 families with 166 persons who started the trial, only 38 families with 125 persons continued taking it till the end of the trial. Eight families with 41 persons, therefore, did not accept food yeast as supplement in their diets.

In Indaurabagh out of 30 families with 75 persons who started the trial only 24 families with 57 persons continued taking food yeast to the last. 6 families with 18 persons dropped out. The percentage of acceptability, therefore, in villages Thana and Indaurabagh was 75·3 and 76·0 respectively.

The effect of food yeast on the health of the consumers was judged by comparing the deficiency signs, weight, haemoglobin percentage, and subjective symptoms like sleep, appetite, and capacity of work etc. before and after the trial. It was noticed that there was some improvement in the health of the consumers but the results could well be within the statistical error.

Discussion

The dietetic surveys in the various parts of the State as well as in the present study have revealed that the average diet of the people is notoriously deficient in first class proteins, vitamins and minerals. The output and consequently the intake of milk, meat, fish and eggs are far below the actual requirement. There is a large section of people who have religious objections to the intake of animal foods. At present food yeast appears to be the only solution to improve the nutritive value of the predominantly cereal diets of the masses provided it is acceptable to them. There are vast natural resources in the form of molasses, wood pulp etc. for its production in the State. It is quite cheap and is required in small amounts to supplement the diets.

It is an established fact that food yeast as supplement to poor diets is very useful in improving the health of the people. But only about 75 per cent of the people amongst those under feeding trial accepted food yeast when it was given free at their doors. It was apprehended that if the period of trials was further extended there would have been a further fall in the number of consumers. What would have been the reaction of the people if they had to pay for it? Probably none or very few would ever have purchased it from the market. Food habits die hard and it is extremely difficult to change them however useful the change may be.

The only possibility at present appears to be that food yeast may be used in institutional feeding programmes. School boarding houses, jails, asylums, hospitals, hotels and cafes may be advised to incorporate it in their common dishes so that nutrition of the people served by these institutions may improve. The manufacture of food yeast in the country may be taken up and the institutional feeding will ensure a minimum sale of the food to the industry till such time the masses realise its importance.

Summary

Consumers' feeding trials with food yeast lasted for about three months at Thana in 38 families including 125 persons and four months at Indaurabagh in 24 families with 57 persons. The acceptability was 75·3 per cent in the former and 76 per cent in the latter.

⅓ oz. of food-yeast mixed in *atta, dal* or curried vegetables was consumed daily by a person without untoward effects.

Acknowledgments

Our thanks are due to the Director of Medical and Health Services, U.P. for kindly permitting us to send this communication for publication and to the District Medical Officer of Health, Basti and Officer Incharge, Extension Training Centre, Bakshi-ka-Talab, Lucknow, for their help in carrying out the trials.

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PRACTITIONERS' SERIES

SOME COMMON PSYCHIATRIC DISORDERS OF CHILDHOOD*

A. K. DEB, M.SC., M.B., D.P.M. (ENG.)

AND

PRASUN KUMAR GHOSH, M.SC., C.A. PSY. (CAL.)

Calcutta

The classification of psychiatric disorders in the present stage of our knowledge may be compared to 'sailing in an uncharted sea'. Hence it is better for us to start discussion of some of the common disorders which are met with in the clinic in our daily practice.

Causes for which Parents Seek Advice

Parents and guardians come to the clinic primarily for the following difficulties:

(1) When the child does not pass the milestones of life such as sitting up, standing, walking and speaking in usual time, i.e., when the child seems to be *grossly mentally deficient* (idiotic or imbecile).

(2) When the child shows some *behaviour and emotional disturbances*, e.g., when he is aggressive, noisy, destructive and restless; or when there are temper-tantrums, bed-wetting, eating difficulties, sleep disturbance etc.

(3) Children are often referred to the clinic for their antisocial tendencies such as persistent lying, stealing, truancy, running away from home, sexual aberrations, etc. The intelligence level of these delinquent or psychopathic children may or may not be somewhat below average (feeble-minded or moron). These children do not conform to the rules of the society from which they come and they frequently get into trouble for rebelling against restraints and restrictions. These social psychopaths are *temperamentally defective*.

(4) *Backward or educationally subnormal children* (*E. S. N.*). These children may remain in the same class of an ordinary school for several years. In spite of coaching, cajoling and beating they are unable to progress satisfactorily.

(5) *Epileptic children* with or without convulsions. Because of their fits these children cannot compete on equal terms with normal children. Instead of treating them and giving them suitable training according to their intellectual capacity, parents often stop their education altogether. These children often suffer from amentia and/or there may be onset of psychosis with dementia later on when the fits are uncontrolled for a long time.

(6) *Physically handicapped children*, i.e., those afflicted with poliomyelitis or spastic paralysis, myopathy, blindness or deafness or those suffering from some congenital disease of the heart or from rheumatic fever, infantile gastroenteritis or tuberculosis may become dull and backward because of irregular schooling and lack of guidance and special facilities for training.

(7) *Psychotic children* who are mentally disturbed, withdrawn, apathetic, asocial and negativistic: These schizophrenic children gradually lose contact with reality and they live in their own created fantasy. They dislike interference of any kind, e.g., feeding, touching, washing and dressing. They may cover their face with hands or with a sheet. They may spit repeatedly, smile and mutter. The disease may start after being unsuccessful in some examination or the failure may be ascribed to the disease itself which remained latent so long. It may follow as well on some acute febrile illness such as enteric fever or it may be superimposed on mental deficiency.

During investigation the parents frequently deny any psychological abnormality in the family history at first but slowly and gradually many significant facts are revealed later on. Physical trauma is held responsible for the abnormality in many cases; although minor birth injuries are so common any serious aftermath is relatively rare. Only serious head injury is to be taken into account such as cases of asphyxia and cerebral haemorrhage.

The factors of dietary deficiency of vitamins and protein and endocrine deficiency, virus infections, viz., measles, chickenpox, rubella, mumps and whooping cough, prematurity, maternal age, primogeniture, rhesus factor incompatibility giving rise to severe jaundice of the newborn, irradiation along with cultural and economic factors and family size have to be seriously taken into consideration. Thus increasing mother's age is certainly significant in cases of mongolism. The exposure of pregnant women who survived the catastrophe, to irradiation after atomic bombardment of Nagasaki and Hiroshima has increased the incidence of microcephaly and mental retardation in Japan. The case of mental deficiency is a product of factors partly hereditary and partly environmental. It is the interaction of nature and nurture.

* Based on a paper read in a clinical meeting of the Indian Psychoanalytical society, November 1957.

Types of Cases Encountered

In the clinic we often come across the following types of mentally defective children:

(1) Mongolism 3 per cent (Figs. 1 and 2, *vide* Plate), (2) Microcephalic 3 per cent, (3) The mischievous (apache) type following encephalitis in childhood 5 per cent, (4) Spastic type of paralysis (Fig. 3, *vide* Plate) with mental deficiency 3 per cent, (5) Myopathic (Fig. 4, *vide* Plate) (pseudohypertrophic muscular dystrophy) associated with mental deficiency 2 per cent, (6) Epilepsy with mental deficiency 6 per cent, (7) Problem children 11 per cent (delinquency with mental deficiency), (8) Reading retardation (dull and backward children) 8 per cent, (9) Severely retarded children usually suffering from various kinds of speech defect 24 per cent, (10) Epiloia, hydrocephalic (Fig. 5, *vide* Plate)—each 1 per cent, (11) Unclassified M.D.—9 per cent (Fig. 6, *vide* Plate).

Treatment

The problem of mental deficiency is primarily social and educational and medical treatment is considered as an adjuvant measure. Children are often brought to the clinic too late, the guardians think wishfully that everything will be alright with the passage of time.

Gross abnormality of the brain is found only in cases of idiocy and imbecility while in the feebleminded (high grade deficiency) and educationally subnormal children social factors seem to be more significant. One may be surprised to find that the former cases are mostly found in the homes of professional and well-to-do people while the latter are recruited from the families of unskilled labourers.

Idiots, cripples and severe epileptics require a great deal of nursing care. The high grade imbeciles and the feebleminded on the other hand are more in need of educational help, training and rehabilitation. Mentally defective children require more care and attention than normal children and for a longer period.

Reduction in the size of the school classes, reduction of overcrowding in the home, increase in cultural and recreational facilities would certainly improve the social background. In this way there is likelihood of reducing the number of mental defectives.

Deficiencies of vitamins such as vitamin A, riboflavine, pantothenic acid, folic acid (pteroyl glutamic acid) and vitamin E are found in the diets of pregnant women of lower income groups. These are held responsible for such abnormalities of the foetal development as hydrocephalus, anencephaly, anophthalmia, syndactyly and cleft palate. Radiation hazards are increasing in recent years and there is every chance of rise in encephalopathies and mental defect in future on this score.

As regards medicinal treatment in mental defectives many drugs are used rather empirically. Sedative drugs are administered to make them quiet and to check epileptic fits. Some restless children respond well to drugs like drinamyl especially in postencephalitic type. Glutamic acid, vitamins and hormones are given to improve the level of intelligence and to correct any deficiency present as a substitution therapy. A combination of drugs like bellergal, priscophen, etc., is often employed to restore such autonomic imbalance as incontinence and salivation. Surgical measures have few indications in the treatment of mental defectives.

Clinic care—In our clinic the child is first examined thoroughly by the psychiatrist and an attempt is made to control emotional disturbance present with the help of suitable sedative drugs or tranquillising agents. Thereafter, when the child is more co-operative mental testing is carried out by the psychologist. The defective is then given individual or group training in a class according to his or her intellectual capacity. Defective children are usually fond of music and the inmates of our insititution (Bodhipeet) participate regularly in morning and evening prayer. The higher grades are given training by the occupational therapist.

Home care—Home care of mental defectives is possible with very moderate material resources and with sympathetic understanding and patience. Play and toys are of particular importance in the training of mental defectives. Lower grade defectives learn more when they are conditioned like animals to do certain acts such as dressing with a particular set of clothes after a great many trials. They derive much less benefit from verbal instructions (stimuli) what Pavlov referred to as the 'second signalling system'. They may be able to carry out a certain act after repeated practice without being able to say why they do it. Persistent training when carried out systematically along with affection and tolerance is bound to yield a satisfactory result. In this way defectives can serve the society in a humble way without being a complete burden on it and their admission to few mental deficiency institutions can certainly be deferred for many years. Home training, however is difficult because of the emotional disturbance prevailing there. Where training centres are not available, a teacher may visit patient's home once or twice a week. This arrangement may help

the patient attend school later on. Physically handicapped, mentally defective children, e.g., those who are blind, deaf or paralysed are advised to go to special schools whenever possible.

School care—In the school there should not be more than twelve children in a class and the classrooms should be well-lighted and ventilated. The first object is to teach the child to look after himself, so that he may attend to his basic physical needs such as feeding, dressing, doing up buttons, tying strings of trousers and toileting independently. Secondly, training should be given to facilitate the development of speech and understanding speech. Singing lessons may help in improving speech. In this way, he will be encouraged to make social contact with other children. Thirdly, occupational training is given with suitable equipment thus the defective will learn to use his hands and his intelligence. Children learn by imitation. Hence the teacher must do repeatedly what he wants his pupil to learn. The equipment should be bright, attractive and handy to stimulate the child's sensory and manual capacity. Defective children are often fond of music. Hence physical training will be accepted more readily if accompanied with music. Participation in games may be helpful in checking restlessness. The teacher must not expect rapid progress in these cases. Praise and encouragement must be given for every small achievement. Admonition if necessary must be accompanied by suitable explanation. Discipline is inculcated in this way. A definite and ordered routine must be devised for every activity such as prayer and play, dinner and rest. High and medium grade defectives (I.Q. ranging from 80 to 50) develop manual dexterity and co-ordination by such activities and crafts as bead threading, needle work, rugmaking, basketry etc. Drawing, painting and modelling give children opportunity for free expression. They must also be taught to do such domestic tasks as dusting, sweeping, making arrangements for dinner, cooking, serving food, washing and ironing. Finally, coaching in simple arithmetic, reading and writing will enable them to be usefully employed and rehabilitated to society.

A good many defectives can earn their living by doing routine simple repetitive work. Further, their performance can be improved by training and practice. In modern times there is no room for gloomy attitude and therapeutic nihilism even in cases of mental defectives. They are not such a great social problem as they were considered before. Mentally retarded children that is those who are slow learners can be taught to do simple jobs under supervision. If their handicap cannot be cured it can certainly be endured with more ease and comfort provided their training and treatment are started early. Hence it is incumbent to follow the progress of every child very carefully from birth onwards so that any difficulty in its mental and physical development can be detected at an early date and necessary arrangement for proper treatment and training can be made persistently and consistently.

CASE NOTES

DERMATOMYOSITIS*

AMAL CHAKRAVARTI, M.D., M.R.C.P.

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AND

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Dermatomyositis, as a clinical condition, has been grouped under the collagenoses. Among the various conditions of the said group, its resemblance to scleroderma particularly, is very striking. Nothing definite is known, as yet, as to its aetiology. Though it is obscure, cases of dermatomyositis usually present a more or less well-defined clinical picture to meet diagnostic recognition in most of the cases. Better appreciation of those clinical characteristics in recent times has led to the discovery of progressively larger number of cases, compared to the past. Thus, according to a Mayo Clinic assessment, the reported incidence of the disease has gone up from 6 patients per year (1916) to 25 patients per year (1953) (Christianson *et al*, 1956).

Though by now dermatomyositis is a well-recognised clinical condition, sufficiently widely reported in literature, the writers are not aware if any authenticated case of dermatomyositis has been reported from India so far. We therefore considered it worthwhile to report the following case.

Case Report

Mrs. D. S., Hindu female, aged 20 years, was admitted on 14-12-56, with a history of illness, dating about a year and a half. She said that about 1½ years ago, she had a febrile illness for a short period, associated with puffiness of the hands and feet: 3 days later, the fever subsided, the oedema disappeared but she was left with a feeling of stiffness in her hands. Gradually the stiffness went on spreading to involve more and more

* Case demonstrated at School of Tropical Medicine Calcutta at a clinical meeting held in March, 1957.

Fig. 1

Fig. 2

Fig. 4

Fig. 3

Fig. 5

Fig. 6

DEB AND GHOSH—*Some Common Psychiatric Disorders of Childhood (p. 402)*

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Fig. 1

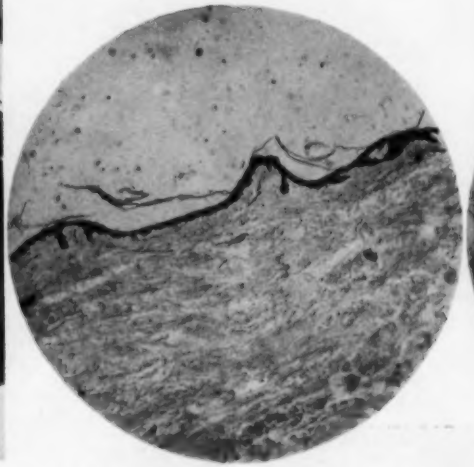

Fig. 2

Fig. 3

CHAKRAVARTI AND DAS—*Dermatomyositis (p. 404)*

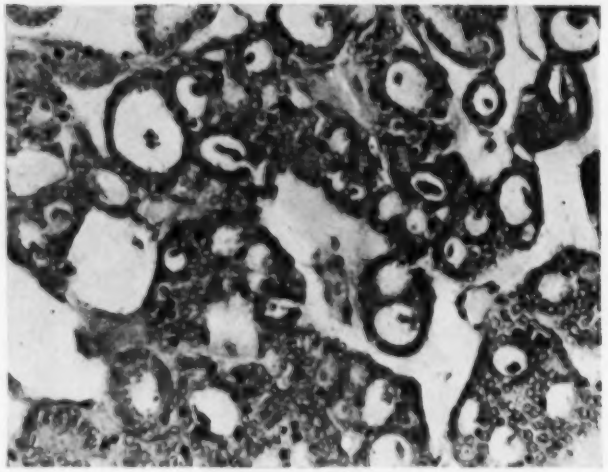

Fig. 1

DEVADATTA—*Diagnosis of Thyroid Metastasis by Radio-Iodine (p. 409)*

Fig. 1

Fig. 2

ANSARI—*Keratosis Punctata Palmaris et Plantaris (p. 410)*

wide areas of the body. Thus, in course of time she had difficulty in combing the hair, changing her dress, bending her body or in getting up from the sitting position. During the earlier part of her illness the stiffness was noticeable only in the day time. Later on however, the stiffness became more and more persistent. With the progress of the stiffness, she became increasingly weaker, exhausted, fatigued and lethargic. Even with all these complaints, she was able to carry out her routine household duties for about a year. A year after the commencement of her illness, however, the condition went on deteriorating very fast. She had a second febrile episode ; this time compelling her to be confined to bed. The fever lasted for about a week ; at the end of this period, in the convalescent stage of the disease, she noticed that she had become almost completely crippled. She had great difficulty in opening the mouth, protruding the tongue, moving the head and extending the limbs. She had no power to sit up in bed. Also, in the last 3 months, she noticed, that her skin was becoming progressively darker.

She gave history of an acute respiratory tract infection in early childhood, diagnosed as pneumonia, and a similar history 2 years before the onset of her present illness.

There was no relevant family history. She was married 2 years ago. Her menstruation started at the age of 13 years ; periods regular. She was of active habits and was accustomed to do physical exercise (*asanas*) even a few months prior to her marriage. She is a nullipara.

On examination—The patient appeared thin, and very sparsely built with practically no subcutaneous fat.

Skin—heavily pigmented, dark, pigmentation being most marked in the neck, abdomen and extremities, the face and terminal parts of the fingers appearing lighter in colour in comparison. Moreover, the skin over the fingers and central part of the face appeared smooth, shiny, glossy, tense and taut, so that, it was difficult to lift up the skin from the subjacent tissues over these areas. On the abdominal wall, pigmentation, instead of being diffuse, presented a reticulated, mottled appearance (Fig. 1, *vide* Plate). There was some hypertrichosis over the forearms. No obvious changes were noticeable in the nails or hairs.

Muscles—Facial muscles, showed diffuse wasting with marked paucity of facial movements, either in response to emotional changes or on volitional demand. Both the masseters were firm and appeared contracted and exhibited some tenderness on deep pressure.

The patient was unable to open the mouth widely or to move the jaw from side to side. The tongue was small and atrophic and complete protrusion was not possible ; it was covered with a thin, smooth, glossy mucosa. The pharyngeal reflex was normal. The muscles of the neck showed diffuse wasting. Sternomastoids appeared firm, contracted, cord-like, exhibiting some tenderness on pressure. The neck movements were markedly restricted. Muscles of the shoulder and pelvic girdles and similarly muscles of the upper and lower extremities showed considerable wasting of a diffuse nature with very marked deterioration of power and with gross limitation of movement. Besides, contractual deformities were well evident. The limbs were held up, with marked flexion deformities, at the elbow and knee joints.

Neurological examinations revealed no abnormality. There was no complaint of dysphagia, hoarseness of voice, or difficulty in speech.

Mucosal surfaces—Oral mucosa showed evidences of diffuse glossitis and stomatitis.

Heart, lungs, liver, spleen, kidneys revealed no abnormality on clinical examination. Temperature was 98°F, P/R—92/20 per minute and B.P.—110/70 mm. of Hg at the time of admission.

Laboratory investigations—Hb.—70 per cent ; R.B.C.—3·7 million/c.mm ; W.B.C.—5,300/c.mm, polymorphs—63 per cent, lymphocytes—35 per cent, eosinophils—2 per cent. E.S.R.—20 mm./hour (Westergren). Sodium—345 mg. per cent, potassium—21·1 mg. per cent; calcium—12·2 mg. per cent ; creatinine—1·5 mg. per cent ; urea—22 mg. per cent ; N.P.N.—25 mg. per cent ; proteins —5·2 mg. per cent ; alb/glob—3/2·2 per cent. WR and Kahn tests were negative.

Urine—Alb.—nil ; Sugar—nil ; Creatinine—520 mg/day ; Creatine—720 mg/day ; Chloride—7 g./day ; 17 ketosteroid—5 mg/day.

X-rays—Radiologically, barium meal skiagrams of the oesophagus, stomach and intestines were within normal limits. Similarly no abnormality was detected with the skiagraphy of the chest and of the various joints. There was no evidence of any soft tissue calcification or of calcification of the suprarenals ; Skiagraphy of the bones of the pelvis was suggestive of some decalcification.

Skin-biopsy revealed atrophy of the epithelium (Fig. 2, *vide* Plate) with pigmentation and dermal fibrosis.

Muscle biopsy (from sternomastoid) showed some lymphocytic infiltration with necrosis (Fig. 3, *vide* Plate) and fibrosis of muscle.

Course, progress and treatment—Since the patient was in chronic phase of the illness, it

was decided to correct the deformities first, in so far as is practicable. Further, since the patient was confined to bed for a long time and since, flexion contracture at the knees, served as a source of hindrance to her becoming ambulant, correction of deformity of the legs appeared more urgent than flexion contracture at the elbows. Weight traction and manipulation under anaesthesia having failed to correct the deformity, hamstring tenotomy and posterior capsulotomy were performed on the left knee. It was decided to do a similar operation on the right knee at a subsequent date ; on and from the 5th day of the operation, the patient began to complain of severe burning sensation on the sole of the foot of the operated limb. Though the burning feel abated considerably in about a week's time the healing of the wound at the operated side was very much protracted, even in the absence of evidence of any secondary infection. It took about 6 weeks for the wound to close. 7 weeks after the operation, the patient started having bouts of haematemesis. She had several such bouts for 2 days. At the end of this phase, the patient went deteriorating very fast. She lost all appetite, had frequent retchings and nausea. Her condition gave cause for anxiety. It was at this stage, that ACTH was started, to stop the downhill course. ACTH was administered in 75 mg./day, in divided dosage daily, but no significant change in the patient's condition was observed even after 10th day of therapy. On the 11th day of ACTH she had nasal intonation of voice with regurgitation of liquids, heralding the advent of bulbar involvement.

ACTH was still continued, increasing the dosage to 100 mg./day ; on the 16th day of ACTH therapy, her relatives expressed their desire of taking her back and she had to be discharged on risk bond.

She stayed in the hospital for a little over 3 months ; receiving a total of 1·3 g. of ACTH in 19 days during the latter part of her hospital stay. Upto about 8 weeks since her discharge from the hospital she was without any ACTH or cortisone therapy at home with no further deterioration. She continued to live, at the time of writing, confined to bed, crippled and as helpless as before.

Discussion

The mode of onset, the course and evolution of the disease, the very extensive dermal and myositic involvement, biopsy evidence of epithelial atrophy and muscle necrosis leave little room for doubt as to the nature of the malady. There are however, certain interesting features of the case which merit consideration :

(a) The association of features suggestive of scleroderma, e.g., in the central part of the face and over the fingers.

(b) The development of haematemesis in the course of the disease.

(c) Involvement of bulbar muscles, even during the continuance of ACTH in adequate dosage.

(d) Irregular response to ACTH.

As has been stated earlier there are many points of similarity between dermatomyositis and scleroderma and instances are not few, where cases diagnosed as dermatomyositis were later found to be cases of scleroderma ; on the other hand, proved cases of dermatomyositis have been found to have scleroderma in association.

Haematemesis in dermatomyositis is likely to raise problems firstly because it may mean (1) presence of an associated peptic ulcer, (2) association of a gastric neoplasm or (3) gastric mucosal involvement by the disease process itself. Cottell (1952) reported 2 cases of dermatomyositis in association with gastric and renal neoplasm ; Brunner and Lobrialle (1951) cited a case of dermatomyositis in association with malignant neoplasm and collected 17 such cases, from a review of the literature. In the case under review, clinically or radiologically, there was nothing to suggest a gastric neoplasm or a peptic ulcer. Haematemesis was perhaps due to extension of the mucosal involvement by the disease process itself. Secondly, appearance of haematemesis in a case of dermatomyositis calls for a restrained use of ACTH or cortisone unless one has very definite reasons to believe that the haematemesis is a part of the disease process itself.

In dermatomyositis, besides involvement of the skeletal musculature, involuntary muscles may be affected. Onset of bulbar palsy in the present case, therefore, is nothing unusual but certainly it is not common to expect it while the patient is under adequate cover of ACTH.

With ACTH and cortisone, both success and failure have been reported. Successful management of acute cases of dermatomyositis have been reported by Elkinton *et al* (1949), Oppel *et* al (1950), Williams and Bowler (1951) and Clein (1953). In the management of chronic phases of the illness, however, correct therapeutic assessment of the ACTH group of drugs is not always possible. Such cases have been reported by Ragan (1950) quoted by McElligot (1956), Thorn *et al* (1950), Anderson (1952), Gross (1952) and Wedgewood *et al* (1953). While in some of these cases, either there was no response or negligible improvement, in others, the drugs were found to have distinct influence in controlling acute exacerbations, controlling febrile bout, causing a disappearance of rash or enabling the muscles in regaining some of the lost muscle power. Further, cases are reported where corticotrophin failed but improvement occurred with cortisone (Thorn *et al*, 1950). In the case under review, the patient had irregular treatment with ACTH and cortisone prior to her admission to hospital, particularly

during her febrile episode, which was stated to have been controlled by the drug.

During her stay in hospital, however, no improvement was noted to have resulted from ACTH. The patient failed to regain sufficient muscle power to enable her to stand even after the correction of contractural deformity by operation; on the other hand, there was extension, to involve the bulbar muscles, while still under ACTH therapy for full 10 days. ACTH was used in preference to cortisone because of low 17 ketosteroid output.

Summary

A case of chronic dermatomyositis of 2 years' duration in a young female is reported. Several features of interest, in the present case, have been pointed out.

Acknowledgments

Thanks are due to Dr. N. Das, Surgeon Superintendent of Sambhunath Pandit Hospital, Calcutta, for allowing us to report the case. Thanks are also due to Dr. N. G. Moitra, Radiologist, Dr. S. N. De, Professor of Pathology, Medical College Hospitals and Dr. B. P. Ghosh, Professor of Bio-Chemistry, S. S. K. M. Hospital, for their invaluable help. The authors are grateful to Dr. S. Bhattacherjee, Surgeon, S. N. P. Hospital for kindly consenting to perform hamstring tenotomy.

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DIAGNOSIS OF THYROID METASTASIS BY RADIO-IODINE

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This is a report of an interesting case where radioactive iodine (I^{131}) was helpful in the diagnosis of a thyroid secondary deposit in bone.

Case Report

L. C., a male, aged 44 years was admitted on 10-7-1956 with the history of a lump on the chest of 3 years' duration. Twenty years ago the patient noticed a swelling on the left side of the neck which was gradually growing in size. It was not until 4 years ago the patient sought medical advice regarding this lump and the diagnosis of a thyroid tumour was made. At that time a subtotal thyroidectomy was done in another hospital. It is not known if the removed gland was subjected to histological examination. One year later (i.e., 3 years ago) he noticed a lump on the right anterior part of the chest which was gradually increasing in size. It was painless. The patient gave no history of cough, nor of any pressure symptoms, such as dyspnoea, dysphagia, or hoarseness of voice.

On examination the patient appeared well nourished. There were no palpable lymph nodes. In the neck, a transverse scar was seen at the usual site of a thyroidectomy incision. The thyroid gland was not palpable. On the anterior chest wall, near the junction of the second and third right ribs with the sternum, was a lump measuring 3 inches by 2 inches. On palpation it was almost bony hard, not warm, and tender only on deep pressure. Its edges were smooth and rounded and it was not fixed to the skin. It was fixed to the underlying bones and was not movable in any direction. The axillary lymph nodes were not palpable. Examination of the heart, lungs and abdomen revealed no abnormality. The blood pressure was 140/90 mm. of Hg.

Radioactive iodine studies—100 microcuries of I^{131} was given orally to the patient and counts were carried out over different areas 24 hours later by means of a scintillation counter.

Over the right lobe of thyroid	17450/min.
Over the lump	16833/min.
Over an area between the right lobe of thyroid and the lump	1248/min.
Over the opposite side of chest	704/min.

Treatment—A diagnosis of thyroid metastasis to the anterior chest wall was made and the tumour was resected. The postoperative period was uneventful and the patient was discharged on the 15th postoperative day.

Pathological examination of specimen—Microscopic section showed a thyroid follicular adenocarcinoma (Fig. 1, *vide* Pate).

Discussion

In this case the question of whether the lump on the chest wall was in fact a thyroid metastasis had to be answered. Doubt was entertained because the thyroid lump had occurred 20 years previously and was removed 4 years ago. This question was settled by the radio-iodine studies described above. It will be seen from the results that a much higher count was obtained over the lump on the chest wall than over the corresponding area on the opposite side. The count over an area midway between the lump and the right lobe of the thyroid gland was less than that obtained over either the thyroid or the lump. These findings ruled out the possibility of the high count over the lump being due to "scatter" radiation from the thyroid gland.

The usefulness of I^{131} in the detection and diagnosis of thyroid metastasis is limited by the fact that not all thyroid carcinomas take up iodine. It has been the experience of most authors writing on the subject that follicular (or non-papillary adenocarcinoma is more likely to concentrate I^{131} than the papillary or the anaplastic varieties. Thus in a recent report where 37 patients with thyroid carcinoma were investigated, concentration of the radio-iodine by the tumour was definitely found in only 7 cases. Five of these were follicular carcinoma and two were papillary carcinoma (Kilpatrick *et al*, 1957).

Acknowledgments

I am grateful to Dr. R. H. Betts for resecting the tumour and to Dr. P. Koshy for permission to report this case.

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KERATOSIS PUNCTATA PALMARIS ET PLANTARIS

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Punctate keratosis of palms and soles is a comparatively rare idiopathic condition of the skin first reported by Davies Colley in 1879. It has been given various names like 'keratoderma disseminatum palmaris et plantaris', 'keratodermia maculosa disseminata palmaris et plantaris', 'punctate keratosis of palms and soles' and 'keratoderma punctatum'. Galloway (1918) reported two cases in husband and wife who were first cousins-german and gave the list of cases reported up to that time including the papers of Balzer and Germain (1905), Buschke and Fisher (1900) and others. He concluded that the case reported by Buschke and Fischer (*loc. cit.*) was similar to his own cases. Sweitzer (1923) and Lieberthal (1926) reviewed the literature and gave a detailed description of the clinical features and the histological appearances in this condition. Michael (1933) described a case and traced the incidence of this anomaly in six generations of his patient's family. He concluded that the mode of inheritance of this condition was a simple regular dominant. More recently Scott, Costello and Simuangco (1951) reviewed the literature and described the clinical and histological appearances in three Negro patients.

As far as the author knows, there is no reference of 'Keratosis punctata palmaris et plantaris' in the Indian medical literature. It was therefore considered of interest to report the following five cases of this condition amongst Indians.

Case Reports

CASE 1 :

M. B., married female, aged 60, was admitted in the Osmania Hospital on 15-10-54 complaining of breathlessness, cough, and swelling of the legs. She worked as an ayah in her young age. She had not suffered from any other severe illness except the one for which she was admitted in the hospital (congestive cardiac failure).

On examination, an unusual condition of the palms was noticed. Both the palms were found to be studded with small hard warty growths. These lesions were of dark brown colour and of hard consistency. They varied in size from minute points to $\frac{1}{4}$ mm. in diameter, and were raised from the surface of the skin. A few taller and more pointed lesions were found on the sides of the palms and on the sides of the palmar surfaces of the fingers. Rest of the skin of the palm appeared to be quite normal. Similar lesions in small numbers and of bigger size were also present on the sides of the soles. The lesions counted were approximately 225 on each palm. The patient stated that the lesions were noticed by her when she was about 40 years old. She said that the lesions used to get less prominent or disappear when she was up and active doing her household work. But owing to her illness, for the last six months she was in bed and therefore the lesions had grown bigger. The patient also stated that the lesions never gave her any trouble. As far as she knew none of her relatives suffered from a similar condition. There was no

history of taking any arsenic. Her blood W.R. was negative.

Skin biopsy—A small piece of the skin of the right palm containing a few lesions was excised for histological study. This showed thickening of horny layer of the skin at the site of the lesion. No changes were seen in the other layers of the skin.

CASE 2:

E. R., an office peon, aged 55, was admitted in the hospital complaining of breathlessness, cough and oedema of the legs for 3 years. He was married.

On examination the patient was found to be suffering from congestive cardiac failure. There were small nodules on the skin of both the palms and also on the soles. The patient said that he noticed them first when he was about 16 years old. He was then working on the farm and thought that these lesions might have been caused by handling the thorny objects during the course of 2 years of work there. The lesions had gradually increased in number. Five years ago a barber removed all of them but they grew again in about two weeks' time. The lesions had never given him any trouble.

The nodules were found to be multiple, discrete, firm, of dark colour and slightly raised. They varied in size from pin point to 2 mm. in diameter. They were distributed over the palms and soles and the skin between the lesions was quite normal. Some of the nodules were pointed, others had either flat tops or depressed tops. Removal of the nodules resulted in the formation of pits. On examining one of the nodules thus removed, it was found to be of conical shape with the narrow end embedded in the skin. One of the nodules removed was soaked in sodium hydroxide solution for 5 minutes which made it soft and also swollen. The preparation was put on the slide and cover slip was pressed on it.

Microscopic examination—The prepared nodule was found to consist of non-nucleated epithelial cells. Sections of the skin from the palm showed enormous thickening of the corneous layer at the side of the lesion. Scrapings of the lesions examined did not show the presence of any fungus.

Nodules of the palm and palmar surfaces of fingers of the right hand were removed by means of the point of a knife. The removal of nodules resulted in the formation of pits. The lesions were found to grow from the pits in the course of about two months. Blood W.R. was weakly positive. There was no history of taking any arsenic.

CASE 3:

K. S., a cultivator, aged 60, was admitted in Osmania Hospital on 18-11-56 complaining of dry cough, fever and pain in the left side of chest for about 2 months. He was suffering from left pleural effusion. The patient was found to have hard brownish, nodules and pits scattered over the palms and palmar aspect of fingers. The soles were free. He noticed the small raised nodules on the palms for the first time when he was 18 years old. He stated that they were gradually increasing in number and that they never troubled him. As far as he remembered no other members of his family had suffered from a similar condition.

On examination, the lesions were found to be in the form of hard nodules and also in the form of pits distributed over the palms and palmar surfaces of the fingers. Both of these, were from pin point to 2 mm. in diameter. The nodules were of dark brown colour with flat or slightly depressed top. The pits were thinly filled with a keratinous substance. On the right hand the nodules were chiefly distributed on the hypothenar eminence and the pits on the thenar eminence. The nodules and pits together were about 300 on the right hand. 130 of these were nodules and the rest were pits.

Microscopical examination of the lesion showed an enormous circumscribed thickening of the horny layer (Fig. 1, *vide* Plate). The keratinous mass appeared to press on the deeper layers thereby flattening the underlying papillae. No changes were found in other layers of the skin. Examination of scrapings from the lesions for fungus was negative.

CASE 4:

R. L., a weaver, aged 40, was admitted in the hospital on 5-5-57 suffering from congestive cardiac failure. The patient also had a number of brownish nodules on the palms and soles since he was 20 years of age. These lesions, though symptomless, were gradually increasing in number. He was in the habit of picking out the nodules but they used to grow again after a few weeks. His father and one of his uncles had similar lesions on the palms and soles. Both of them used to get the nodules removed by a barber once a month at the time of their haircut. His elder brother and sister were also suffering from a similar condition.

On examination, the lesions were found to be more numerous on the soles than on the palms. The lesions on the hands were chiefly present on the palmar surfaces of the fingers. The lesions on the hands were hard, slightly raised, brownish papules with central pitting and varying in size

from a fraction of a millimeter to 3 mm. The lesions on the soles were bigger, most of them in the form of pits, some of them (arrow-marked in Fig. 2, *vide* Plate) containing a hard keratinous plug in the centre. Some of the smaller lesions on the plantar surfaces of toes had no central pitting.

Skin biopsy—The skin section from the palm and the soles showed the presence of the thickening of the corneous layers. Other layers of the skin were normal. Scrapings from the lesions were negative for fungus. The blood W.R. was negative.

CASE 5:

S. A., an ironmonger, aged 55, in apparent health was found to have hard yellowish papular lesions on the palms and palmar surfaces of the fingers. Similar but bigger and more numerous lesions were also found to be present on the soles. The patient stated that he noticed the lesions on the soles for the first time when he was twenty years old. Since then the lesions were gradually increasing in size and number. The patient used to pick out the lesions quite easily. For the last few years he was noticing similar lesions on the palms of the hands and palmar surfaces of the fingers. He was not at all troubled by them. His father also had similar lesions. He had three step brothers who were free from these lesions. The patient said that out of his four children the eldest son, aged 25 had a few similar lesions on his palms.

On examination—The palms showed the presence of numerous raised roundish lesions, yellowish in colour, having central pits and varying in size from $\frac{1}{2}$ to 4 mm. in diameter. They were distributed mostly on the thenar eminences and a few on the tips of the fingers and the centre of the palms. The soles showed mostly the pits containing hard plugs in the centre. The lesions here were found to be more numerous on the pressure points and a few on the skin of the arch of the foot and back of the heel. Patient did not agree to a biopsy examination. Wassermann reaction of the blood was not done.

COMMENT

The cases reported here, presented the clinical features and histological appearances characteristic of keratosis punctata palmaris et plantaris. Certain variations, however, in the clinical features were noticed as have also been described by some authors previously. Matsumoto (1918), quoted by Sweitzer (1923), for example, reported a case in which the palm showed a few small punctate hyperkeratotic lesions. There was no central pitting and no evidence of hereditary tendency.

Four out of the five cases reported here, were found to have similar histological findings but varied to some extent in their clinical features. In Cases 1, 2 and 3 the lesions were smaller in size, harder in consistency and darker in colour. They were uniformly distributed on the palms, on the palmar surfaces of the fingers and were less numerous on the soles of the feet. Central pitting in these cases, though present in some of the lesions was not marked. In Cases 1 and 2 some of the lesions on the medial and on the lateral borders of the palms and on the sides of the fingers, were, comparatively taller than the other lesions. These two cases were suffering from congestive cardiac failure and they were almost bedridden for some months. It may be that the increase in growth might have resulted from lack of use of the hands in these cases. Case 3 had both nodules as well as pits on the palms. The distribution of the pits on the right hand in this case indicated that probably constant friction and pressure of the handle of the plough on the thenar eminence removed the nodules, thereby leaving the pits in these sites. The case was not followed long enough to verify if these pits could be filled up again during the period of rest and inactivity. Cases 4 and 5 were similar in their clinical features and in both of them there was a history of similar lesions in the other members of the family. In these two cases most of the lesions were pitted in the centre and they were comparatively larger in size, lighter in colour, and distributed more numerously on the soles than on the palms. Some of the lesions on the soles contained a hard keratinous plug. These cases presented the clinical features and histological appearances as well as hereditary tendency similar to those found in cases described by Galloway (1918), Lieberthal (1923) and others. Histological findings of the sections of the skin lesions examined in Cases 1, 2, 3 and 4 were similar; that is thickening of the horny layer of the skin with no other changes in the other layers. The age of onset in all the cases except Case 1 (in Case 1 the condition started when the patient was 40 years old) was between 15-20 years. Three of the five cases (Cases 1, 2 and 4) were suffering from congestive cardiac failure. All these five cases had these lesions for about 20-40 years but none of them complained of any subjective symptoms whatsoever. There was no history of taking arsenic in any of these cases. Scraping of the skin from the lesions examined in three of these cases (Cases 2, 3 and 4) did not show the presence of any fungus. The first case reported here, was noticed accidentally, but the other four cases could only be detected after careful routine examination of the hands and feet of the patients admitted in the two medical wards of the Osmania General Hospital in the course of about 3 years. This shows that the condition though rare, may be detected if particularly looked for. The persons affected do not seek medical advice as the condition remains symptomless.

SUMMARY

Five cases of keratosis punctata palmaris et plantaris occurring in Indians are reported. Their clinical features and histological appearances are described.

Histologically all cases were similar. But they differed in their clinical features.

In two of the five cases reported (Cases 4 and 5), there was history of the anomaly in other members of the family.

ACKNOWLEDGMENTS

My thanks are due to Dr. Bankat Chandra, Officer-in-charge, Osmania General Hospital, for permission to report these cases. I am also thankful to Dr. B. K. Naik, Professor of Medicine, Osmania Medical College, for referring Cases 2, 3 and 4, to Dr. V. Gopal Rao, Professor of Pathology, for the sections of the skin and to Dr. Bhoomkar, my house physician, for the photomicrograph.

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INTRAPERITONEAL RUPTURE OF HYDRONEPHROSIS

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Rupture is an uncommon complication of hydronephrosis. This may occur spontaneously, but is generally the result of traumatism. There is usually extravasation of urine into the perinephric tissue, giving rise to pseudo-hydronephrosis. More rare is the rupture which occurs into the peritoneum. Obviously intraperitoneal rupture is a serious complication and recovery from it depends on prompt recognition and intervention.

The case described is that of an intraperitoneal rupture of a left-sided hydronephrosis.

CASE REPORT

A Sikh boy, aged 11, was admitted to the Sanctoria Hospital, Disergarh, with acute abdominal pain, following an abdominal injury 6 hours back. The boy fell from a height of about 6-7 feet with his abdomen impinging against a blunt projecting metallic piece. He was unconscious and in a greatly shocked condition immediately following the injury. With stimulants he regained consciousness after about 15 minutes, vomited several times and started complaining of acute pain all over his abdomen. There was no external injury.

On examination—The boy was of average build. He was slightly anaemic (haemoglobin 62 per cent). Pulse and respiration rates per minute were 82 and 22 respectively. Temperature was normal. The tongue was moist.

There was muscle guarding all over the abdomen, with acute tenderness in the epigastric region. Flanks were dull on percussion, and shifting dullness was present. There was no loss or diminution of liver dullness. Intestinal peristalsis was conspicuously absent.

Rectal examination revealed no tenderness.

Straight x-ray of the abdomen did not show any subdiaphragmatic accumulation of gas.

Provisional diagnosis of intraperitoneal rupture of an abdominal viscus was made and laparotomy decided.

Operation notes—Laparotomy was done under nitrous oxide, oxygen and ether anaesthesia. The peritoneal cavity was full of clear watery fluid mixed with blood. All the intraperitoneal abdominal viscera were inspected but no injury was visible. The fluid appeared to gush from the left side of the peritoneal cavity and after a search a rent was observed in the posterior parietal peritoneum to the left of the mesenteric attachment. The rent led to a big hydronephrotic sac with a glistening white fibrotic wall. The kidney substance was very much thinned out. The other kidney was inspected and found to be normal. An abdominal nephrectomy was performed, rent in the posterior peritoneum repaired and the abdomen was closed after a thorough toilet.

Postoperative period was uneventful except for fever for the first 4 days ranging between 99° and 101°F. Penicillin and streptomycin were administered daily for 7 days during the postoperative period. The patient went home after 10 days.

COMMENTS

Proper diagnosis in the present case could not be made due to lack of information regarding presence of hydronephrosis. This information was later obtained from the patient's father who noticed a swelling in the upper abdomen. This was trouble-free and hence no treatment was ever sought. This unilateral hydronephrosis was probably due to "congenital defects. Cases of left-sided congenital hydronephrosis are often remarkably silent (Boyd, 1955).

SUMMARY

A case of intraperitoneal rupture of hydronephrosis is reported.

REFERENCE

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JOURNAL OF THE
INDIAN MEDICAL ASSOCIATION

CALCUTTA, JUNE 16, 1958

KWASHIORKOR

Sickness of the weanling has been accepted by all as 'kwashiorkor'. The disease manifests characteristic clinical picture associated with constant alteration in serum proteins and recognisable changes in the liver, pancreas and other organs. Majority of infants suffering from 'kwashiorkor' are between one and two years of age, when they are weaned and placed on rice or other nonprotein substitutes. These infants are extremely apathetic, manifest varying grades of diarrhoea, patchy crazy dermatoses, specially over the genital area, anaemia, massive oedema with characteristic 'moon face' and pigmentary changes in the hair. They invariably respond dramatically to generous helping of skimmed milk or other protein supplements.

This disease as a clinical entity due to protein undernutrition gained great publicity primarily in African children. An accurate and excellent review[1] on the subject has been published in 1954. The reviewers have drawn attention to the global incidence of the disease. But the exact incidence of 'kwashiorkor' in several parts of India has so far not been reported. Such data are necessary. Studies of this nature may disclose local factors, if any, that may either contribute or precipitate the onset of 'kwashiorkor'. A very informative review[2] on the subject drew attention to the incidence of the disease in Coonoor, Madras; the reviewers had seen some florid cases of acute 'kwashiorkor' in the coastal districts of Andhra Pradesh. Incidence of this condition in Bengal[3], Pepsu[4], Agra[5], Indore[6], Hyderabad[7] and Guntur[8] is now recognised. Reports of the protein malnutrition field survey units of Indian Council of Medical Research from Kerala and Andhra Pradesh are eagerly awaited, for these reports are likely to shed light not only on the incidence of 'kwashiorkor' but also on the factors that contribute to the development of the condition.

Recent reports on 'kwashiorkor' laid stress on the variation in clinical manifestations and changes in the liver. It has been remarked[2] that the typical cutaneous changes of 'kwashiorkor' are not seen in considerable number of cases and this has been emphasised from Jamaica[9]. Reports from Guntur[8] also drew attention to this fact and cautioned that these cases were likely to be missed. Some have also pointed out the absence of clinical manifestations in these children of pancreatic dysfunction, so much exaggerated by the African workers.

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In 1945 it was demonstrated[10] that fatty liver was a constant and early change in cases of 'kwashiorkor'. This statement has been substantiated later and fatty change in the liver as high as hundred per cent has been recorded. The experience of workers from other countries in recent years has been different. Absence of fatty change of the liver in 'kwashiorkor' in quite a considerable number of cases has focussed the attention of many. This is noticed more so in the elderly children and several Indian reports[2, 8, 11] point out the higher age incidence of 'kwashiorkor'. Other forms of liver injury in the form of cytoplasmic vacuolation, reduction in cytoplasmic basophilia, necrosis etc., are being recognised in cases of 'kwashiorkor' and also in experimental animals fed on protein deficient diet[9, 12].

The association of portal and/or septal fibrosis with or without fatty change of the liver in cases of 'kwashiorkor' has led many to suggest the development of cirrhosis at a later stage. Literature[8, 9, 11, 13-14] on this subject in the recent ten years has given contradictory views in that one and the same worker on the subject had earlier suggested the progression of liver changes to cirrhosis who later, based on wider experience and follow up studies specially through serial liver needle biopsies, have made guarded statement in that changes in the liver noticed in these cases do not progress to cirrhosis. The alarmingly high incidence of cirrhosis in India, specially in the South[15] should offer impetus for workers in the field to realise the extreme importance of follow-up studies of different types of liver injury in children with the prime object to evaluate, whether these cases if untreated progress to cirrhosis so commonly seen in the adults. The urgent need for this study need hardly be emphasised when one realises the equally high incidence of primary carcinoma of the liver in the South of India[16, 17].

Recently Sriramachari[18] observed extensive mesenchymal activity in the livers in cases of protein malnutrition and in every one of them hyperglobulinaemia was seen. Similar findings have been reported from Guntur[8] in cases of malnutrition. This poses the problem of the role of mesenchymal reaction in the pathogenesis of cirrhosis. Careful clinical and experimental studies could only throw further light on this most exciting observation.

'Kwashiorkor' or other clinical manifestations in children are only a stamp of overpopulation and consequent poverty and undernourishment. Vigorous efforts to arrest the alarmingly increasing population, liberal supplies of cheap and easily procurable protein substitutes to suit the taste of all communities and early recognition and treatment of all types of malnutrition noticed in children on a planned basis can only improve the physical and mental stature of the children of our country, when they reach adulthood.

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CURRENT MEDICAL LITERATURE

Liver Damage in Congestive Heart Failure

WAHI AND OTHERS (*Indian J. M. Research*, **46**: 13, 1958) from the Liver Diseases Research Unit, Department of Pathology, S. N. Medical College, Agra, give below the summary of their observations on clinical, biochemical and histopathological study of liver damage in congestive heart failure :

A combined clinical and biochemical study on 61 cases of different aetiological types of congestive heart failure has been done. Out of these histopathological correlation was done in 29 cases in which puncture biopsy of the liver was done.

Histopathological changes showing the transition from the earliest centrizonal congestion to advanced cardiac fibrosis have been described.

Most severe form of central necrosis was seen in congestive heart failure due to mitral stenosis. The clinical severity of the failure was fairly closely related to the severity of central necrosis. The latter was also closely related to the duration of the disease. Mitral stenosis was the commonest cause of cardiac fibrosis.

Abnormality of the liver function tests was not closely related to the clinical severity of the disease. Albumin and globulin content, cephalein-cholesterol flocculation and bromsulphalein excretion tests tended to be more abnormal in cases with advanced central necrosis. Patients with high serum bilirubin values were also those with severe hepatic damage.

A very significant finding was a marked aminoaciduria in patients with advanced congestive failure.

The mechanism of central necrosis and fibrosis is briefly discussed.

Fats in Atherosclerosis

GOUR AND GUPTA (*Indian J. Pub. Health*, **1**: 100, 1957) from the Department of Medicine, S. N. Medical College, Agra, made an experimental study on the role of various fats in the pathogenesis of atherosclerosis. Twentyfour chicks of four weeks age of the same breed and approximately of same size and weight were selected and divided into six groups of four chicks each, e.g., control group, cholesterol group, *ghee* group, Vanaspati group, cocoanut oil group and mustard oil group. *Bajra* (millet) was given to all the groups as the basic diet. This served as control for the first group. The second group was given 0·5 per cent cholesterol and the remaining groups were given different fats (according to the name of the fat) in 15 per cent concentration. General condition, growth and weight were recorded at regular intervals. Plasma total cholesterol and plasma lipid phosphorus were estimated every 4 weeks. The study was continued for a period of 32 weeks. At the end of the study all the chicks were sacrificed and the different organs were studied in detail both in gross and under the microscope.

It was observed that 0·5 per cent cholesterol produced atherosclerotic lesions in the aorta and the coronaries while "ghee" and different vegetable oils in 15 per cent concentration could not do so. However, these neutral fats produced fatty changes in the liver. The atherosclerotic lesions consequent upon cholesterol feeding were associated with gross hypercholesterolaemia and raised C/P (cholesterol/lipid phosphorus) ratio while 'ghee' and vegetable oils did not produce any appreciable rise in these levels. The neutral fats, however, produced inhibited dietary intake and retardation of growth and development.

Follow-up Study of Fifteen Cases of 'Kwashiorkor'

SRIKANTIA AND OTHERS (*Indian J. M. Research*, **46**: 121, 1958) from the Nutrition Research Laboratories, I.C.M.R., Coonoor, S. India, give below the summary of their observations on the results of the follow-up study of 15 cases of 'kwashiorkor' including a histopathological examination of the liver biopsy specimens of all these children :

Protein-deficiency type of vacuolation of the liver cells, which could be corrected by dietary protein supplementation was the predominant finding. Evidence of increased fibrous tissue formation was significantly absent. Liver function, as judged by serum albumin and serum cholesterol levels, appeared to be unimpaired.

Experimental Peptic Ulceration

ZAIDI AND MUKERJI (*Indian J. M. Research*, **46**: 27, 1958) from the Central Drug Research Institute, Lucknow, in dealing with the significance of 'mucus barrier' in experimental peptic ulceration write :

Acute peptic ulceration has been produced within a period of four hours with massive doses of histamine in guinea-pigs protected against its toxic effects by an antihistamanic—promethazine hydrochloride. The damage of the gastric mucosa varied from erosion to perforation accompanied by congestion and oedema. Significant positive correlation was found between free acidity and the degree of ulceration. The mechanism of ulcer production has been discussed. It has been suggested that hyperacidity and oedema of the mucosa were the causative factors for peptic ulceration.

The significance of 'mucus berrier' in the prevention of histamine-induced ulceration has been studied. Mucus was produced in guinea-pigs by using capsicum as an irritant. The more the production of mucus, the less was the degree of ulceration. Mucus also protected mucosa and submucosa from inflammatory reaction. The higher the mucin contents, the lower was the free acidity. It has been suggested that mucin neutralised the action of acid gastric juice, also adhered to the surface of the mucosa and formed a barrier against peptic ulceration.

Capsicum in small doses for a short period did not produce any mucosal haemorrhage or ulceration or even depletion of epithelial cells of the gastric mucosa of guinea-pigs. The most important gastric response was the production of massive amount of mucus.

Phenergan when administered to guinea-pigs brought about a delay in the emptying of the stomach. There was no change in the free acidity and mucin contents but the peptic activity appeared depressed. Phenergan did not induce haemorrhage, erosion or ulceration of the gastric mucosa. (*Authors' summary*).

Salt-Losing Renal Syndrome

HEINTZ AND SCHNEIDER (*German M. Monthly*, **2** : 338, 1957) from the First Medical Division, University of Frankfurt, write that in course of renal insufficiency gross renal losses of sodium and chloride may occur as a result of inadequate reabsorption by the damaged tubules. The resulting syndrome of salt depletion is known as 'salt-losing renal syndrome', 'salt losing nephropathy' or 'salt-losing nephritis'.

The diagnosis is suggested when a history of renal disease and the signs of uraemia are associated with a relatively low blood pressure, polyuria, dehydration, weakness and muscle pain. Nausea and vomiting are seen occasionally. The diagnosis is confirmed by the finding of high urinary excretion of chlorides in the presence of hypochloraemia and hyponatraemia.

When there is no history of renal disease and the optic fundi appear normal, Addison's disease will need to be excluded. This is done by the demonstration of normal 17-ketosteroid excretion in the urine and a normal Thorn test in the salt-losing renal syndrome. The diagnosis is important from the point of view of treatment, as renal insufficiency with renal salt loss presents a definite contraindication to a salt-free diet. The daily dietary salt supply should be equal to the sodium chloride loss in the urine.

One instance of the rare fully developed syndrome of salt depletion in a case of chronic diffuse glomerulonephritis is described, as well as 3 cases of the more common abortive forms of the syndrome, one in chronic nephritis, one in polycystic renal disease, and one in acute nephrosis.

Urinary Tract Obstruction and Renal Function

BRICKER AND OTHERS (*Am. J. Med.*, **23** : 554, 1957) from the Department of Medicine, Harvard Medical School and the Peter Bent Brigham Hospital, Boston, Massachusetts, the Renal Physiology Section, Research and Development Branch Fitzsimmons Army Hospital and the Department of Medicine, University of Colorado School of Medicine, Denver, Colorado, give in the following lines the summary of their observations on four patients in whom an abnormality in renal function developed in association with mechanical obstruction of the urinary tract :

Clinically, the presenting manifestations were those of acute renal failure (complete urinary suppression and symptoms and signs of renal insufficiency). Immediately following relief of the obstruction by appropriate instrumentation, polyuria occurred, varying in duration from several days to three and a half months. The maximum twenty-four-hour urine volumes ranged from 4·5 L. to 15 L. and the twenty-four-hour sodium excretion from 250 to 1,900 mEq. Renal function studies were conducted during the diuretic phase in all patients, and in two patients follow-up studies were performed after subsidence of polyuria. The initial studies revealed impairment of glomerular filtration rate, renal plasma flow and concentrating ability. The most impressive feature of the nephropathy, however, was the abnormality in salt and water excretion which was responsible for the polyuria. Analysis of this abnormality, based on current physiologic interpretations, led to the following conclusions : (1) the diuresis was similar to that seen in nomal subjects during experimental osmotic diuresis ; (2) the diuresis resulted primarily from the delivery into the urine of an excessively high percentage of the sodium and chloride filtered at the glomerulus ; (3) the defect in sodium and chloride excretion could be related to suppression of tubular reabsorption ; and (4) the latter was located predominantly in the proximal segment. The ability of the patients to decrease salt and water excretion in response to enforced fluid restriction favours the primacy of the tubular defect in the genesis of the polyuria. However, potentiation of the diuresis in one patient by the infusion of an isotonic saline solution suggests that concurrent fluid administration may influence the magnitude of the diuresis.

Follow-up studies demonstrated improvement in the majority of parameters examined, indicating that the nephropathy attendant upon urinary retention includes multiple renal functions.

Certain of the functional patterns noted in the present patients may also be observed in subjects with advanced Bright's disease and with othe renal salt and water wasting syndromes. The possibility has been considered, therefore, that qualitatively similar defects in sodium and chloride excretion may be operative in these states.

Hypernatraemia After Cerebral Injury

GORDON AND GOLDNER (*Am. J. Med.*, **23** : 543, 1957) from the Surgical Research Unit, Brooke Army Medical Centre, Fort Sam Houston, Texas in describing in detail two cases in which hypernatraemia, hyperkalaemic, azotaemia and acidosis developed in comatase patients after severe cranio-cerebral trauma, observe :

Both patients excreted small urinary concentrations of sodium but rather large quantities of potassium. Clinical and chemical improvement occurred after rehydration but hypokalaemia developed in each case. Both patients had functional impairment of the frontal lobe after prolonged convalescence.

The hyperosmolarity, azotaemia and hyponatruria in each case could be explained as a normal physiologic response to serve water deficit (induced *via* fever, sweating and hyperventilation) with possible secondary renal tubular damage. Evidence is reviewed that salt retention represents a normal response by volume-regulating mechanisms to a fluid deficit caused either by (1) imparied osmoregulation in the hypothalamus or hypophysis and/or (2) marked renal or extrarenal water loss. It is suggested that the unconscious patient who has a brain injury is prone to the development of unrecognised water deficit which might in some cases be detected only by frequent chemical analyses of the blood.

Diagnosis of Adrenal Cortical Dysfunction

NABARRO AND OTHERS (*Brit. M. J.*, **2** : 1012, 1957) from the Institute of Clinical Research, the Middlesex Hospi-

tal, London, in discussing on some of the problems in the laboratory diagnosis of chronic adrenal insufficiency and Cushing's syndrome observe that a major difficulty has been the lack of any convenient method for estimating hydrocortisone and its metabolites in the urine.

A method based on the Norymberski procedure for measuring total 17-hydroxycorticosteroids is described. The steroid outputs of normal subjects were 7·6 to 23·6 mg. per 24 hours in men, and 4·6 to 17·8 mg. per 24 hours in women. In 100 estimations on urines from adrenalectomised patients the steroid output showed good correlation with the dose of cortisone acetate.

The effect of injections of corticotrophin gel on total urinary 17-hydroxycorticosteroid excretion was compared with that on the 17-ketosteroids. It is concluded that corticotrophin tests for adrenal cortical insufficiency are more sensitive if total 17-hydroxycorticosteroids are estimated.

The total 17-hydroxycorticosteroids were measured in 15 cases of Cushing's syndrome and three of virilising adrenal cortical carcinoma. Estimation of the total urinary 17-hydroxycorticosteroids was of diagnostic value in Cushing's syndrome and should make it unnecessary to undertake numerous time-consuming investigations in patients suspected of having this condition.

Assay of Vitamin B_{12} in Serum

SPRAY AND WITTS (*Brit. M. J.*, **1**: 295, 1958) from Nuffield Department of Clinical Medicine, Radcliffe Infirmary, Oxford, from the analysis of the results obtained with the microbiological assay of vitamin B_{12} in the serum of various types of subjects observe:

The range of values found in 123 normal subjects was from 150 to 1,000 $\mu\mu$g. per ml., with a mean of 450 $\mu\mu$g. per ml. Of 94 patients with pernicious anaemia in relapse, 85 gave values of 100 $\mu\mu$g. per ml. or less, seven gave values between 100 and 170 $\mu\mu$g. per ml., and two anomalous normal results were obtained.

In subacute combined degeneration of the spinal cord the vitamin B_{12} in the serum is reduced to the same levels as in pernicious anaemia, and this has proved useful in differentiating the condition from other diseases of the nervous system.

There is a moderate reduction in the vitamin B_{12} in the serum in pernicious anaemia of pregnancy, but from the U.S.A. who had a family history of the disease.

A considerable proportion of patients who develop megaloblastic anaemia in association with partial or total gastrectomy, diverticulosis of the small intestine, blind loops left after surgery, the malabsorption syndrome, dietary deficiency and anticonvulsant therapy are shown to be deficient in vitamin B_{12}.

Abnormally high results were obtained in all the patients with chronic myeloid leukaemia, but in chronic lymphatic leukaemia the results were normal. In the acute leukaemias and in polycythaemia vera both normal and high results were found.

NOTES AND NEWS

Commonwealth Medical Advisory Bureau

The Commonwealth Medical Advisory Bureau was established by the Council of the British Medical Association ten years ago to provide a welcome for doctors visiting the United Kingdom from other countries of the Commonwealth and also to give any help and advice that they might require either before coming to this country or after their arrival. The address of the Bureau is: British Medical Association House, Tavistock Square, London, W.C. 1.

The Bureau was officially opened in July, 1948, and the use that has been made of it since has shown that it provides a most valuable service. More than 10,000 doctors have sought advice, most frequently on post-graduate education, during these ten years and a similar number of visiting doctors and their wives have attended social functions arranged by the Bureau on behalf of the Association.

New Colour Code for Cylinders of Medical Gases

The system of colouring medical gas cylinders used in India until now has helped the medical profession to identify the cylinders containing the gas that they wished to use. The colours adopted, however, have not corresponded with those in many other countries; as a result there have been accidents arising from mistakes of identification of gases by foreign doctors or by those trained overseas.

As a positive step to remove the danger, Government of India have amended the Gas Cylinder Rules so that the colour markings of medical gas cylinders in India will conform with the international system. The new standard identification colours are tabulated below.

Indian Oxygen Ltd., leading manufacturers of medical gases, have announced that repainting of cyclopropane, nitrous oxide, medical ogygen and medical oxygen/carbon dioxide mixture cylinders to comply with the new colour scheme is being undertaken by all works of Indian Oxygen Ltd. from April 1st, 1958. As cylinders are returned to the works for refilling, they will be repainted at no extra cost to the user.

During the period of changeover it is inevitable that a certain risk will arise from users having cylinders of different colours but containing the same gas. To minimise this period, it would be advisable for all users of medical gas cylinders, as soon as possible after April 1st, 1958, to ensure that every cylinder in their possession is changed to its new correct colour. Stocks of gases in cylinders painted with the old colours should be used up as quickly as possible, but if this cannot be done within two months, it is strongly recommended that any remaining gases in cylinders should be sacrificed and the cylinders sent in for refilling when it will automatically be repainted.

STANDARD IDENTIFICATION COLOURS FOR MEDICAL GAS CYLINDERS

Gas		Cylinder colouring	
Name	Symbol	Valve end	Body
Air	Air	White and Black	Grey
Carbon Dioxide ...	CO_2	Grey	Grey
Cyclopropane ...	C_3H_6	Orange	Orange
Ethylene	C_2H_4	Violet	Violet
Helium	He	Brown	Brown
Nitrogen	N_2	Black	Grey
Nitrous Oxide ...	N_2O	Blue	Blue
Oxygen	O_2	White	Black
Oxygen/Carbon Dioxide Mixtures ...	O_2+CO_2	White and Black	Black
Oxygen / Helium mixtures ...	O_2+He	White and Brown	Black

The colouring of the valve end will extend down to the shoulder; two colours will be in four segments, two of each colour.

NAPT Commonwealth Chest Conference

The NAPT Commonwealth Chest Conference, incorporating the annual conference of the British Tuberculosis Association will be held at the Royal Festival Hall, London from July 1 to July 4, 1958. The provisional programme is as follows.

July 1. Section Meeting: Discussion on Tuberculosis case work in the Commonwealth; Why Have a Social Worker?; Mass Radiography—Past, Present and Future; The Ex-Patient as a Nurse; Inaugural meeting and Reception, official opening by H.R. H. The Duchess of Kent.

July 2. The World Anti-Tuberculosis Campaign, Is it Succeeding?; Danger of the Infection to Personnel in Pathological Laboratories; Towards the Elimination of Tuberculosis in Great Britain; Section meeting: New Horizon in Care Work; Tuberculosis and Leprosy—Resemblances and Differences in Diagnosis and Treatment; Respiratory Disease—A Malady of Environment; The Management of the Heart in Chronic Respiratory Disease.

July 3. Tuberculosis Medical and Social Service in the British Commonwealth; The Heart Patient in Everyday Life; Fungus Disease of the Lung, Pneumoconiosis, Immunity Reactions in Tuberculosis and Sarcoidosis; The Patients' Personality; Section meeting: BCG Vaccination.

July 4. The Family and the Patient with Chest Disease; How Best Can we Help them to Help Themselves?; Thoracic Surgery in Pulmonary Tuberculosis (The British Tuberculosis Association Annual Conference, 1958); The Problem of Lung Cancer.

International College of Surgeons

Prof. Dr. Raffaele di Valmaggiore, head of the surgical clinic, University of Rome has been elected President-elect and Dr. Henry W. Meyerding of the Mayo Clinic, President of the International College of Surgeons (Chicago, Ill. U.S.A.).

For the United States section Dr. Edward L. Compere has been elected President.

The first congress of the European Federation of the college was held in Brussels, Belgium, May 15-18.

The third national congress of the Iranian section was held at Teheran, Iran, May 12-15.

The fifth annual congress of the Japanese section will be held in Tokyo from October 17.

Colonel Amir Chand Trust Prizes for Medical Research

Indian Council of Medical Research which administers the Colonel Amir Chand Trust award prizes annually for the best published research work in any subject pertaining to all fields of medical sciences in general including clinical research.

In 1958 four junior prizes of the value of Rs. 300/- each to graduates of not more than ten years standing, will be awarded for the best research papers in medical sciences published during 1957. These prizes will be known as "Shakuntala Amir Chand Prize".

The competitors for the prizes may be medical or non-medical graduates.

Candidates are required to submit 10 reprints of their papers published during 1957. These should be sent to the Director, Indian Council of Medical Research, P.O. Box 494, New Delhi, so as to reach him not later than the 1st August, 1958. The papers should be accompanied by a short biographical sketch and two copies of passport size photographs of the worker or workers concerned.

Steps to Develop Drug Industry in India

A number of steps have been taken by the Government of India to develop the pharmaceutical industry in the country, says an official press release.

Existing manufacturers are encouraged to undertake production from intermediates near to basic chemicals. New manufacturers are permitted to enter the field on the basis of their undertaking production of basic drugs as soon as possible, in accordance with the programmes approved by the Government.

A proposal for the establishment of a plant to meet the requirements of intermediates, which is under consideration, is expected to be implemented during the Second Plan period.

Based on expert studies undertaken by suitable agencies, proposals for the establishment of a company for the manufacture of synthetic drugs and additional quantities of antibiotics from basic stages, are under consideration.

Special mention is made of the steps taken to expand the manufacture of penicillin at Pimpri and to set up a unit for the production of streptomycin.

A notable increase has been registered in the production of penicillin, anti-T.B. drugs like INH and PAS and anti-dysentery and other synthetic drugs. Licences have also been given for the production of essential synthetics like vitamin A, cortisone, etc.

The production of penicillin increased from 14·09 million mega units in 1956 to 23·5 million mega units in 1957. The production of INH in 1957 was over three

times that in 1956 and in the case of PAS it was over 10 times. The anti-dysentery drugs, produced in 1957, were more than double the production in the previous year. The production of insecticides and sulpha drugs also increased considerably in 1957.

The Development Council for Pharmaceuticals and Drugs was reconstituted early in 1957. The Council's main functions are to suggest norms of efficiency, secure fuller utilisation of installed capacity, obtain maximum production, improve quality and promote better marketing facilities. The Council also recommends targets of production and co-ordinates production programmes.

For the manufacture of basic drugs, capacity has been sanctioned to cover the targets, set by the Development Council, for production by the end of the Second Plan period.

The present sanctioned annual capacity for the production of penicillin is 46·6 million mega units against the target of 40 million mega units. The target of production by 1960-61 of all varieties of sulpha drugs is 450 tons per year and the capacity sanctioned so far is between 450 and 500 tons. The capacity for the production of anti-tuberculous drugs is 28 tons of INH as against 113 tons.

Discussions are going on with the Soviet expert team to finalise projects for the manufacture of basic drugs from basic raw materials. This follows the visit of an Indian delegation to the U.S.S.R., Italy, Switzerland, West Germany and East Germany.

Reaching Medical Aid to Villages

The Prime Minister expressed the hope at New Delhi on May 18 that the Contributory Health Service Scheme for Government employees at Delhi would serve as a nucleus for the development of a national health service, which in course of time would cover the whole population.

Inaugurating a seminar of Contributory Health Service Medical Officers, Mr. Nehru placed great emphasis on the need for reaching medical facilities to the people in the villages and remote hills. He personally felt that it should be made obligatory for medical graduates to spend some time in villages.

The Prime Minister said that the medical practitioner would be able to appreciate the needs of the country better if he spent some years in a village, apart from being able to provide the necessary medical facilities to the people in the countryside. Doctors should evolve a new approach to tackle the gigantic problem of reaching medical facilities to the remotest part of the country. He felt convinced that the tendency to put up big and costly buildings for housing hospitals and schools should be curbed. Simple structures and equipment would do, particularly in the rural areas, he said.

Mr. Nehru commended the example of an Indian doctor, who died last year after several years of devoted service to the people of Birmingham. He had been honoured like a ruling prince at the time of his death by the people.

The Prime Minister spoke with warmth about the dedicated work that some of the Christian missionaries were carrying on in distant hills and jungles of India. During his last visit to the Lushai Hills, he had met a Scottish woman missionary, who had been there for the last 30 years. Head hunting was common in the area when she went to live there. This spirit of dedicated work was more admirable than sudden acts of heroism, he added.

Returning to the subject of medical facilities in villages, he said that often the people were willing to meet at least a part of the cost of starting a hospital. He suggested that the villagers should be intimately associated with the running of dispensaries and hospitals in the countryside.

He added that the criticism that the Government was extending facilities only to a small section of the community was unjustified. In the first instance, it was not desirable to wait till "we can extend the facilities to all." Secondly, pilot projects were necessary for training the necessary personnel. According to him, the non-availability of suitable personnel was a bigger obstacle than were the shortage of money in India today.

Earlier, the Minister for Health, Mr. D. P. Karmarkar, indicated that four to five additional dispensaries would be opened under the scheme shortly in areas where the existing facilities were inadequate. He said that some of the dispensaries were not housed in proper buildings. He paid a tribute to the young doctors serving under the scheme.

Mr. Karmarkar said that the shortage of beds, particularly for maternity cases, continued to be a major problem.

The Director detailed the progress of the scheme during the last four years. He said that the number of dispensaries had risen from 16 to 25 and the average daily attendance increased by over 400 per cent. The expenditure and the contribution of the employees had gone up to Rs. 40 lakhs and Rs. 22 lakhs in 1957-1958 from Rs. 16 lakhs and Rs. 7,50,000 respectively in 1954-55.

According to him, the burden on the public exchequer for providing medical facilities to Government employees had not increased as a result of the scheme.

He said that nine birth control clinics functioned along with the dispensaries under the scheme. Contraceptives were given free to persons of the low income group and at subsidised or wholesale rates to others.

National Tuberculosis Survey

The National Pulmonary Tuberculosis Survey has just been completed by the Indian Council of Medical Research. The main object of the survey was to find the incidence of pulmonary tuberculosis, to determine from this the extent of the problem and to devise anti-tuberculosis measures. Previous surveys were so limited in scope that they could not provide a definite picture of the whole country.

Undertaken in 1956, the survey covered six zones—Calcutta, Delhi, Hyderabad, Madanapalle, Patna and Trivandrum. As skiagraphy was thought to be the essential feature, only such centres were selected which had mass miniature radiography. The sample survey covered in each zone 30 villages, 6 medium-size towns

and 25 to 40 blocks of a city. Villages situated near roads which could be negotiated by heavy mobile x-ray and generator vans were surveyed. Inaccessible villages were not covered. Nearly 90 per cent of the population of the zones were covered. Of a total population of 389,844 in the survey areas, nearly 300,000 persons were x-rayed. Children below 5 years were excluded.

Field teams consisting of about 20 workers had to camp for days together and often work early in the morning and late in the evening as people were available for examination only at these times. Films of the chest were made by a mass miniature radiography set and a schedule incorporating important and relevant information was filled in for each person. Adequate samples from all zones were examined and compared. Finally six readers, including three senior readers, gave their independent findings.

It was observed that the bacillary rate per 1000 persons varied from 1 to 11 in different areas, and the number of active and probably active cases from 7 to 30 per 1000 population. The morbidity rate for women was less than for men. Rates for both men and women showed increase with age. The rate of increase with age for women was much less than that for men.

These are the tentative findings for the large mass of statistical material which is now being tabulated and analysed.

The results seem to suggest that the disease is not showing diminished trends in cities and industrial areas. The incidence has increased in small towns and villages, which had previously been comparatively free from the menace. It is now most marked in villages where the incidence was previously 0·2 and 0·5, and shows a figure the same as in the urban areas. Preliminary results indicate that 2 per cent of the country's population is affected by the disease.

The Indian Council of Medical Research has decided to undertake a separate survey of rural areas, as it considers that the villages so far surveyed are not representative.

World Population Increasing by 5400 an Hour

According to the Demographic Yearbook for 1957 published by the United Nations, world population is increasing by 5,300 an hour—47 million a year and will double its present estimate of 2,737 million before the end of this century. Population has increased almost by a quarter in the last 20 years. The estimated birth rate is now 34 per 100 inhabitants against a death rate of 18.

The Dutch live longest (71 years for men and 74 for women) and the people of India die soonest (life expectancy for both men and women is 32 years). Latin America is the world's fastest-growing area, though numerically Asia leads, adding 24 million annually.

The Yearbook reaffirms that women live longer than men in every country for which statistics were available. The reasons for this has not been isolated but there were possible biological causes and "certainly the conquest of maternal mortality has aided the female in achieving the favourable position she now occupies". Accidents were a leading cause of death among males of most ages up to 44.

Infant mortality had reached "phenomenally low" levels in many countries. But Burma, Brazil, India and parts of Africa still showed high rates. Sweden had the lowest infant mortality (71 per 1000 live births) in 1956 with Iceland, the Channel Islands and the Netherlands close behind.

REVIEWS

Eisen, Kupfer und Eiweik am Beispiel der Leberkrankheiten. Mit besonderer Berücksichtigung der Haemochromatose und der hepatocerebralen Degeneration—Von Priv.-Doz. Dr. J. Lange, Bonn. Mit einem Geleitwort von Prof. Dr. P. Martini, Bonn. 1958. VIII, 89 Seiten, 30 teils mehrfarbige Abbildungen, Gr.-8°, kartoniert DM 13.50.

Iron, Copper and Protein exemplified by Liver Diseases with special consideration of Haemachromatosis and Hepatocerebral Degeneration—By Priv.-Doz. Dr. J. Lange, Bonn, with a preface by Prof. Dr. Paul Martini, Bonn (in German). VIII, 89 pp., 30 partly multicoloured illustr., Georg Thieme, Stuttgart (cardboard) DM 13.50.

The somewhat cryptic title covers original investigations about the correlations between iron, copper and protein metabolism considered in connection with complicated liver-dominated syndromes, such as those mentioned in the title. The author summarises all what is known nowadays about the various phases of iron and copper metabolism in health and disease. Questions of clinical interest have been emphasised and used as starting point of the discussions.

In the introduction the author explains that he investigated the relations between these heavy metals and protein in liver derangements because the liver acts as main depot, metabolistic centre and probably also organ of synthesis of both these heavy metals and their metal proteids, and at the same time decisively influences the general protein metabolism. The next section deals with the normal iron metabolism and its relation to proteins; here are described the characteristic features of iron-protein compounds and their significance for the iron balance, its resorption, transport, depots and excretion. The next chapter deals with the corresponding features of copper metabolism. Of great interest is the survey of serum iron, copper and protein in acute and chronic diseases of the liver and the bile ducts. The next section is devoted to aetiology, pathogenesis, clinic and therapy of haemachromatosis in its relations with iron and protein metabolism. The only effective methods to reduce the abnormally high iron deposits of the liver in this condition are blood letting and decrease of food iron by covering the protein requirements with milk. Attempts to increase iron excretion in the urine by slow intravenous drip of di-sodium-ethylene-diamine-tetra-acetic acid (Di-Na-ADTE) with Periston N are promising but quantitatively not very effective, while pharmacologic means of diminishing enteral iron resorption are not yet successful. Fascinating reading will be found in

the 20 pages dealing with hepatocerebral degeneration or Westphal (1883)-Struempell (1898)-Wilson's (1912) disease (first described by Frerichs, 1861) as a disturbance of the copper-protein metabolism. Under the headings history and definition, clinic, genetics, biochemistry, pathogenesis and therapy, a great number of facts are lucidly presented. Treatment consists of diminished copper resorption with the help of potassium sulphide and special ion exchange resins; increased copper excretion could be achieved to a very small extent only by the use of BAL, while penicillamin was found by the author as effective as claimed by its British discoverer (J. M. Walshe, 1956); corticosteroids need further testing.

This excellent monograph ends with an impressive array of 428 references, fully covering the literature in German, English and French from 1861 to 1956.

Lehrbuch der röntgenologischen Differentialdiagnostik—Von. Prof. Dr. W. Teschendorf, Köln. Band I: Erkrankungen der Brustorgane. 4., verbesserte und erweiterte Auflage. Unter Mitarbeit von Priv.-Doz. Dr. P. Thurn, Bonn. 1958. XII, 1183 Seiten, 1138 Abbildungen, Lex-8°, Ganzleinen DM 210.

Textbook of Roentgenological Differential Diagnosis—By Prof. W. Teschendorf, Cologne, Vol. I. Diseases of Chest Organs, 4th improved and enlarged edition with the co-operation of Priv.-Doz. Dr. P. Thurn, Bonn (in German). Bonn. XII, 1183 pp., 1138 illustr., Georg Thieme, Stuttgart, 1958, DM 210.

Pleasure and awe are the feelings which are aroused in the reviewer on attempting to give the reader an idea of the scientific excellence and physical perfection of this impressive volume. The popularity of this work is proved by the fact that the previous edition of Vol. I, shorter by 230 pp. and 100 illustr., was published in 1952. This success is well deserved and easily understandable as this is perhaps the only complete guide to the *differential* diagnosis of radiological findings and to the evaluation of x-ray signs, the more admirable as the purely roentgenologic differentiation is based on the clinical pictures, so masterly drawn that every essential feature of innumerable pathological conditions stands out in full relief.

This volume deals with diseases of the lungs, the heart (by P. Thurn), the aorta, the oesophagus and the diaphragm. The 637 pages devoted to lung diseases cover every imaginable aspect of this huge subject in a most original way. Differentiation is systematically carried out of haziness of one hemithorax; dense opacities of circumscribed parts of the chest; classification and differentiation of various forms of tuberculosis; diagnostic of round opacities; of coarse, fine and stripe shaped opacities; of cavities and air-filled spaces. An instructive section deals with the differential diagnostic of pictures obtained by bronchography and pulmonary arteriography; a short chapter on the trachea is followed by a fascinating analysis of the normal lung picture and structure, followed by sections on hilar and mediastinal changes.

The 400 pages on the heart start with a description of electrokymography, heart catheterisation, angiocardiography, selective cardio-angiography, retrograde aortography and a lucid discussion of the indications for these special methods. Then follow chapters on normal position of the cardiac cavities and large vessels; inflow and outflow tract; cardiac measurements; haemodynamics of the heart and its x-ray appearance; the enlarged heart; influence of extra-cardiac factors on position, size and shape; acquired valvular diseases; congenital anomalies (26 pp.); anomalies of the large veins, the aortic arch and its branches; isolated diseases of the pulmonary vessels; congenital anomalies of cardiac position; coronary diseases; myocardial and pericardial diseases; traumatic lesions; cardiac tumours; cor pulmonale. The next section deals with all kinds of aortic changes. Diseases of the oesophagus are treated in considerable detail under the headings: alterations of the wall and the relief; congenital stenoses; prestenotic dilatations and diverticula; spasms; atonic and idiopathic dilatations; compression by trachea; aspiration into the respiratory tract; foreign bodies. Excellent is the discussion of radiologically visible alterations of the diaphragms (d). The headings are elevated d. and d. movements; deep standing d., diaphragmatic pleurisy; d. domes; adhesions; diminished tone and paralysis; diaphragmatic relaxation and hernia; gastrocardiac syndrome (Roemheld); d. tumours.

It is difficult to say what deserves more praise, the admirable text or the unsurpassed perfection of the illustrations that in overwhelming profusion illuminate every detail. At the foot of every page complete references to world literature are to be found, an arrangement which saves the reader the usual searching for details hundreds of pages away. The subject index covers 32 pages and seems to be as carefully arranged as every other detail of this grand work, which is urgently recommended for translation into English, so as to enable not only radiologists, but also physicians and surgeons all over the world to reap the full benefit of this incomparable teacher and guide. As the weight of this one volume amounts to 6 lb. 4 oz., it might be advisable to publish the next edition in four instead of two volumes.

Kurze Geschichte der Vestibularisforschung—Von E. Wodak, M.D., Tel-Aviv. 1956. VIII, 162 Seiten, 8 Abbildungen, 8°, Kartoniert DM 13.80.

A Short History of Vestibularis Research—By E. Wodak, M.D., Tel-Aviv, Israel (in German). VIII, 162 pp. 8 illustr. Georg Thieme, Suttgart, 1956. DM 13.80.

The author, who for almost 40 years took part in vestibular research and visited many of the centres where such work is being carried out, gives a most interesting survey of the development of our knowledge of the physiology and pathology of the vestibular apparatus. Starting with Purkinje's experiments in Prague (1820), which led to the definition of nystagmus, he follows our deepening and widening understanding of vestibular structure and function step by step, chronologically as well as geographically. A chapter about the discovery of the vestibular apparatus is followed by sections on vestibularis research in Austria, Holland, Prague, Scandinavia and Finland, Germany, France, Italy,

England, Switzerland, Hungary, Russia, the U.S.A., Canada, Japan and the rest of the world. The course of the historian's report and evaluation is often interrupted by lively personal memories of some of the leading personalities in this part of medical science and marks of deep respect paid to the founders and masters of the subject, such as Flourens and Menière of France, Josef Breuer and Robert Barany of Vienna, Magnus and de Kleijn of Holland, C. S. Sherrington, C. S. Hallpike, Watkin Thomas and others in England, Holmgren of Sweden, Ino Kubo of Japan and many others. Every chapter concludes with a good selection of numerous references in most of the European languages. According to the central position of the vestibular apparatus, the author has rendered very valuable services to physiologists and neurologists, otologists and physicians and to every medical man interested in the history of a fascinating chapter of our science.

Die gesunde und die kranke Wirbelsäule in Röntgenbild und Klinik: Pathologisch-anatomische Untersuchungen—Von Geh. Med.-Rat Prof. Dr. Dr. G. Schmorl. Für Röntgenkunde und Klinik, bearbeitet von Prof. Dr. H. Junghanns, Oldenburg (Oldb.) 4., erweiterte Auflage, 1957. XII, 330 Seiten, 419 zum Teil farbige Abbildungen, Lex.-8°, Ganzleinen DM 86.

X-ray Appearance and Clinic of the Spine in Health and Disease—By the late Privy Councillor Prof. Dr. med. and Dr. med. vet. h.c. Georg Schmorl. Edited for radiology and clinic by Prof. Dr. med. habil. H. Junghanns (in German). XII. 330 pp., 419 partly coloured illustr., Georg Thieme, 1957. DM 86.

To do justice to this work one has to remember what it meant when the first edition appeared in 1932. A new chapter of pathology and radiology had been written by Schmorl, one of the greatest pathologists of his time, based on the minutest macroscopic, microscopic and roentgenologic examination of 10,000 spines. His book became immediately an international standard work on which much further research was based. After Schmorl's death (1932) the book remained out of print for many years until Junghanns, the master's assistant and co-author of the first edition, brought out the second in 1951. Since then the functional aspect of pathology and x-ray diagnosis of the spine became increasingly more emphasised in the quickly following editions, although the solid morphological foundation has been firmly maintained. The 9 chapters deal with growth and normal structure of the spine, malformations, pathological changes of the osseous structures (80 pp.), pathology of the intervertebral disc (65 pp.), spondylosis deformans, pathology of the spinal curvature, pathological changes of spinal mobility, vertebral dislocations and spondylolisthesis, and finally the lumbosacral region. The treatment of every problem is simply masterly and the wealth of references overwhelming; they fill 43 pages of continuous lines in small print and are probably the most complete index of international writing on this subject to be found anywhere. A very special feature of this beautiful work are the illustrations for which no praise is too high; they correlate every anatomical and histological feature with its x-ray appearance and with complete clinical observations in the text; drawings and diagrams further elucidate every essential point. An English translation would soon acquire a place of honour in the library of everybody concerned with the spine, anatomist and pathologist, orthopaedic surgeon and physician, and the host of school and works doctors who in a developed country focus their attention on the spine as one of the key structures of physical efficiency from childhood to old age.

Atlas of Tumor Pathology—(1) Tumors of the Pituitary Gland and Infundibulum—By James W. Kernohan, M.D. and George P. Sayre, M.D. 81 pages, price $1.00; (2) Tumors of the Kidney, Renal Pelvis and Ureter—By Baldwin Lucke, M.D., DR. P.H. and Hans G. Schlumberger, M.D.; 208 pages, price $2.25; and (3) Tumors of the Eye and Retina—By Algernon B. Reese, M.D.; 205 pages, price $2.00. All published by the Subcommittee on Oncology, Armed Forces Institute of Pathology, Walter Reed Army Medical Center; 6825, 16th Street, N.W.; Washington 25, D.C., U.S.A. Loose-leaf binding, 10¼×7¾ inches, stiff paper cover.

The Armed Forces Institute of Pathology of U.S.A. has published various sections of loose-leaf booklets graphically depicting by vivid pictures and colour photographs of the tumours and similar pathological lesions affecting different internal organs. The pictures and photomicrographs in these volumes follow the traditional pattern of these now famous booklets; are clear, expressive, instructive and very nicely demonstrate the lesions that are intended to be presented to the reader. The descriptive text has been kept to the minimum that is necessary, but enough to do justice in explaining the excellent reproductions—many in colour—opposite the text.

Antisera, Toxoids, Vaccines, and Tuberculins in Prophylaxis and Treatment—By H. J. Parish. E. & S. Livingstone, Edinburgh, pages x+ 256, price 30s.

A brief but comprehensive presentation of the immunising agents and diagnostic antigens is the feature of this book. Photographic representations of some of the procedures for preparation of these agents would be useful for those interested in such work. Coloured representations of the reactions of the skin to Schick test, B.C.G. inoculation and primary vaccination would be helpful to those who have not actually seen these reactions. However, these appearances should be expected to be rather different in the pigmented skin of Indians. The busts of some of the eminent contributors to the foundation and development of bacteriology and immunology, though sandwiched between the last few pages of the book, would serve as a source of inspiration to all its readers. The book should be particularly useful to the physicians who use these agents but have hardly any time to go through the extensive literature outlining the knowledge gained on the use of these agents.

Medical Mycology—By N. C. Dey, Published by the author, Assam Medical College, Dibrugarh, Assam, pages 127, price Rs. 15/-.

A product of a versatile author, who has written books on diverse subjects, it would find a place among those for whom it is chiefly intended. The book is profusely illustrated with 38 plates, 3 of which are coloured, and 46 text figures. Some of these, however, appear to be exaggerated reproduction of nature. Perhaps such exaggerations are useful for the students to understand the nature of the involvement. As would be expected, the book devotes itself more to diseases caused by the fungi rather than to systematic mycology. It should, therefore, be useful for those engaged in the diagnosis and management of the diseases of the skin.

Outlines of Fractures, including joint injuries—By John Crawford Adams, M.D. (LOND.), F.R.C.S. (ENG.). Board bound with paper jacket, 8¼"×6", 248 pages. Published 1957 by E. & S. Livingstone Ltd., Edinburgh and London. Price 27s. 6d. net.

This book is intended primarily for the medical students, for the practitioner who seeks a knowledge of general principles rather than of specialised details, and also for the physiotherapist. As explained by the author, most fractures are now treated at special fracture clinics attached to hospitals, and it is often unnecessary for the general practitioner to know much about the details of fracture treatment; although he should be able to diagnose or suspect a fracture and also advise his patients intelligently. In a small book of this size, dealing with the big subjects of fractures, including joint injuries, one can expect to find only the "outlines" and principles. Within this limited but well-understood context, this book is expected to serve its purpose quite well.

Tetracycline—Antibiotic Monograph. 3.—By Harry F. Dowling, M.D. Medical Encylopedia Inc., 30 East 60th Street, New York 22, N.Y.

This publication, the third of the Antibiotic Monograph Series is devoted to Tetracycline. Tetracycline is the principal moiety of the other two derivatives discovered before, aureomycin or chlortetracycline and terramycin or oxytetracycline. The antibacterial activity of the new drug covers the same field as its two early precursors and yet its discovery has been hailed as an advance in antibiotic therapy. The author has discussed the merits of this new drug. Details of clinical application and evaluation of results have been discussed in eleven different chapters. This enables clinicians to get a complete account of the antibiotic, its merits well asserted and drawbacks clearly exposed. The references on the literature published at the end of each chapter will be very helpful.

The introduction of a new antibiotic is an advancement to the science of therapy, yet proper screening and rational application is always desirable. This book gives all the necessary information to guide the clinicians in the scientific application of the drug.

OBITUARY

Dr. Manas Kumar Roy Choudhury, M.B.B.S., F.R.C.S. (Edin.).

We record with deep regret the passing away at an early age and under tragic circumstances of Dr. Manas Kumar Roy Choudhury, Visiting Surgeon, Nilratan Sircar Medical College and Hospital and Consultant Chest Surgeon, Kanchrapara Tuberculosis Hospital and Serampore Tuberculosis Hospital, on 14th April, 1958. Dr. Roy Choudhury's connection with the I.M.A. was close and long-standing. For many years he was Secretary, Calcutta Branch and represented the Branch in the Central Council. He adorned several other offices in the Association, to which he brought his characteristic drive and enthusiasm.

Dr. Roy Choudhury's connection with this Journal was personal and intimate as he had been one of our valued referees.

DR. MANAS KUMAR ROY CHOUDHURY

Dr. Roy Choudhury hailed from Tripura and was born at Dacca in East Bengal. He had his early education at Dacca where he had a good academic record. In 1940 he entered the Calcutta Medical College and took his M.B.B.S. He worked in the surgical side of the Calcutta Medical College Hospital as intern for some time. In 1949 he became Officer-in-charge, Surgical Out-patient Department. Later he became Anaesthetist and Surgical Registrar and continued in these positions until September 1951.

He joined as an intern the Thoracic Unit, University of Edinburgh in October 1951 where he worked until July 1955, completing in the meantime his F.R.C.S.

Dr. Roy Choudhury while attending on a junior colleague suffering from virus infection caught the infection himself and succumbed. A brilliant career was thus cut short abruptly. Dr. Roy Choudhury's heroic example is worth emulation by all medical men.

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SUPPLEMENT
Journal of the Indian Medical Association

Vol. 30, No. 12 CALCUTTA June 16, 1958

X ORISSA STATE MEDICAL CONFERENCE 1958, CUTTACK

The 10th Orissa State Medical Conference was held at Cuttack on 23-24 February, 1958. Dr. George Patnaik presided. Delegates and members of the profession from various parts of the State attended the conference. Dr. H. K. Mahatab, the chief minister of Orissa was the chief guest. The Health Minister of Orissa, Srimati Basanta Manjari Devi, inaugurated the conference. Padmasri Dr. Isac Santra and Dr. B. Patnaik presided over the scientific sessions. Dr. S. N. Gantayet, Director of Health Services, opened the scientific exhibition.

Dr. Jyotsna Dei, the chairman of the Reception Committee, welcomed the guests and delegates. In her speech she said, "Our duty as citizens is not a solitary one that of being doctors. It is connected with all the duties that belong to us as men and as citizens those virtues that are requisite to render us worthy of our people. We must take our places in the world's work of rehabilitation and re-construction not alone of bodies and of mind, but of spirit. Things will grow worse unless we strive to make them better. We must not shrink from doing the task. Let it be said that amid declining morals and waning patriotism that physicians as a class remain to carry aloft in triumph the standard of the country's greatness, its good. May we have our part in a new and better day."

Dr. J. Dei
Chairman, Reception Committee

Dr. George Patnaik, the president of the conference, in his address said :

Medical Relief

"The privilege of an all-round education and the humanitarian outlook which we doctors receive is not available to most of our countrymen. The progress of the science of medicine is now immensely full of reasonable solutions for preventing and eradicating diseases for which there were no remedies a few decades ago. Should we expect our Government fixing a target when all our people, rich or poor, be provided with best possible treatment admitted by scientific solutions? We have omitted it in our second five-year plan. Should not we attempt to have it even by fourth or fifth five-year plans? We have probably neglected to discuss these matters over and over again as a routine in our professional meetings. We cry of confusion in different indigenous systems practised and even sponsored by the Government. Should not we try to explore the validity of any system by scientific means? Should we think that our system is the only valid system? This problem dovetails into various other academic and economic issues, of which our people in the government are now anxious to find solutions first. With this thesis in view, free meetings and discussions of the members of the state, society and professionals are the only means to take decisions nearer truth. Permit me to say, with due respect to all concerned that let us do our part as best as we can to bring relief to the masses and fearlessly point out to all what is the best to have the best possible treatment available to all citizens of this great country. Let us teach our people to raise the standard of their health as they are anxious to raise the standard of living.

Doctor in Society Defined

Simple statistical figures of new experiments and discoveries have not demonstrated the almighty wall in raising the standard of practice of scientific medicine nor university qualifications in extensive parenthesis have ever made doctors acceptable as such to the society. A doctor in the society has to acquire other qualifications to be a leader of a competent and hardworking group of people with whom he lives. He has to work as a cleaner for the evils of the society and in fact its watchman and caretaker. The architecture of his health consciousness is recurrently reflected to the society as a constitutional underpass to all the effective knowledge of individual well-being. His philosophy reaches all doors rich or poor, friend or foe. His competence in human relationship should make him a research worker all throughout his life. His findings will be always significant, though not scholarly. Wishing to gain pro-

fessional credit, he follows the great teaching of Confucius in rectifying his own heart before he tries to rectify those of others. The ivory tower of his being good to others is built on the master plan of Hippocrates (400 B.C.). *De Prisca Medicina* prescribes the physician to acquire all the good qualities of a philosopher; his impartiality, tranquil judgment, serenity and modest decisions have to remain above par; his dignity and purity of living leads him to know what is useful and necessary and reject all that is wicked. Devotion to divinity makes his soul free from suspicion. The Atharva Veda had elevated him even to divinity. Both his divine and worldly qualities lubricate the human relationships with which he trades and softens contacts with the society and inscribes an immortal document bearing signature of souvenirs of those who have crystallised their talents to ailing humanity. He has ever valued quality above quantity. He has to dig truth for himself and fill his mind with noble thoughts about others. He is trained in science, its techniques and methods but practises an art. His models vary from individual to individual though fundamentally same. He studies men, their pattern, diversity and character and makes vital decisions about them. He gains thereby enough moral courage and patience to train himself in being a friend, philosopher and guide to his fellow-men by treating their body, mind and spirit. He is prone to pursue in silence and serenity the applause or abuse for the service done to others in good faith. He has to receive a liberal education to practise his profession and continue such education till he treats men. His ethics teach him to be tender and compassionate.

Quackery

We professionals have talked much on quackery which still continues unhampered in spite of repeated protests made to the Government. I think it is a problem of great magnitude which our state has still to appreciate. The medicine-men in ancient society laid the foundation of the modern science of the healing art. Notwithstanding the retrospect of ancient methods of the art, the positive evils of quackery cannot be supported but we have to consider if stringent laws should be enacted before we have provided proper medical aid and relief to the masses. Riddled with poverty, ignorance and opportunity the chronicity of social evils has made our masses to cling to the untoward ways and means to treat themselves. We would rather ponder if a healthy propaganda will improve matters.

Rural Medical Relief and Service

The appalling state of affairs in the rural areas is a concern for all of us. We have already started giving our students training for a rural bias but any new experiment to be really effective needs honest assessment of its applications and results and as such our leaders should now pause to consider if the field of experiments of providing rural medical relief would result in augmenting their health standard and consciousness. I am tempted to remark here that our rural dispensaries need be all provincialised and the medical men posted to such dispensaries should have adequate pay and allowances, particularly for education of their children etc. In short we have yet to make our rural services very attractive by making them economically secured.

The saviours of our nation, to my mind, have a 'slogan' that the nation will be healthier and appeal to our noble profession to work for it. A seven-nation regional conference of the W.H.O. made an appeal to local governments to assign a much higher priority to rural health services than is given now. The Conference which solely discussed rural health problems confronting South-East Asia expressed that environmental sanitation should receive special emphasis in the basic health services. The question of organising health units, health services and nutrition are allied problems. It urged that the public health and medical care should be integrated at all levels. The size of population for a rural health unit should be between 20,000 and 30,000 and sub-units set up according to the health needs of the area.

Medical Education at Cross Roads

Paralleling the scope and development of any other sciences, medicine in India has been at the cross-roads. Its work in this country has not begun. Its success depends on proper planning, keeping in view that there will be a straight road leading from the cross-roads. We should now think of the ways and means to have a basic qualification before a person is permitted to practise any system of medicine. At the close of the nineteenth century Sinclair said "students learn surgery which they will never practise and will practise midwifery which they have never learned". Half of the next century has elapsed but such and similar defects in undergraduate medical education still exist and the curriculum for the study of scientific medicine is still unsatisfactory. Really speaking our system of medical education today entangles the student in a great superfluity of detail drowning him in a vacuum of no practical knowledge. Most of the doctors qualifying today start with a life of probables and possibles, amidst which he has to earn a living. In general practice he acts only as an expert but in himself he is a worried doctor with his anxious patients. If we think that the glorious days are lying ahead of our traditionally noble profession of scientific medicine, should we be content with practitioners of average standards? Should not we be enriched and ennobled by generations of ideal doctors with first-rate creative work and personality? Our medical institutions are run with paucity of teachers. The method of selecting medical students by merit alone has not worked to produce leaders in science of medicine ; we select our students by an obsolete method. Is it difficult for us to find a better means for selecting candidates for study of medicine? We can cooperate with Government to set up an expert body to see that we select proper candidates who will be ideal medical students—cultured, broadly educated in humanities, humane, sympathetic and intelligently prosecuting the study of the art and science of medicine. Let us have persons who will love their profession and their fellow men. Granted that the curriculum of study for medicine has been drafted in an excellent manner, students trained through it are expected to have the expert knowledge to treat their patients with sympathetic interest but the distintegrated state in which he is taught and examined gives him only a degree or diploma without the needed training. Should not we expect our universities to take up these important matters without any delay? We are still waiting to see how the Indian Medical Council brings solution to these basic problems in the undergraduate medical education ; mere promulgation of standards in the reports of various expert committees of Indian Medical Council and few written remarks about the system of examinations will never solve the problems of training better doctors. It appears that the experts have indeed dreamt of basic doctors only without defining the basic and fundamental curriculum of undergraduate medical education.

Health Planning

The planning of health of this country emphasised control of communicable diseases, improvement of environmental hygiene, provision of institutions to serve us—the basis of organising health services, with facilities for training of medical health personnel and family planning centres. Health programmes appropriated a sum of Rs. 131.00 crores during first plan ; the second plan provides Rs. 267·00 crores. Apart from the personnel requirements for the overhead planning, the provision of rural health was taken up as the central theme of the plan ; the object of which was to be achieved by organising 'Health Units' under National Extension Blocks and Community Projects. It is proposed to complete near about 4000 health units in the whole country. Referring to our state we are still in need of many more health units. The need of trained personnel in this state is in

my opinion much more than that in the neighbouring states. I understand that the present Chief Minister, Dr. Harekrushna Mahatab and Health Minister Srimati Basanta Manjari Devi are anxious to see that our State achieves the desired goal of providing adequate medical care to the mass of the people. The care and anxiety to improve the existing state of affairs in the Health Programme of the State has been borne by their tenacity in seeing that the only medical college of this state competes with similar institutions in the country. The Health Minister in particular is now anxious to provide for another medical college at Sambalpur while upgrading the departments of the existing medical college to take up post-graduate teaching and research at once. But will she achieve her objectives single-handed? Precisely then, she needs co-operation from her own colleagues as well as from the educators and medical men of the State. Let us not be lost in a cesspool of waste and confusion that the State will have to undertake the overall responsibility of training the health personnel required for the State. In a country where the people believe in different systems of medicine and still persist with fanatical zeal to treat themselves with mantras, charms, etc., the members of a Medical Association have to see that the government is assisted with their expert opinion at all stages of progress. We have to combine our efforts and request our Minister of Health that she has to see that a second medical college is soon started to evolve another centre in the State for training more health personnel. She has to be an envoy in seeing that medical graduates and other health personnel from Utkal are trained on an all-India basis. Our friends in the Medical College are a set of young energetic workers teeming with enthusiasm ; I am sure every one of them is anxious to see that the medical education of the State advances in par with other States. I am sure our Minister will also use them sooner to plan the new medical college.

We are eager also to do our bit in helping the crusade of her most laudable ambition to fight against the number one killers of tuberculosis and cancer.

Chandpur hospital for tuberculosis will be one of her immortal actions ; she is anxious to equip it with most efficient ways and means to deal with the problem of tuberculosis in the State. We gratefully appreciate the magnitude of her motive to serve her State and we think that nothing should deter her from her objectives for putting her State in the forefront with regard to the crusade against cancer also in the same envious zeal as one through which she has been instrumental in seeing the Medical College at Cuttack and Tuberculosis Hospital at Chandpur, thrive against all odds.

She is not a doctor but she loves the profession and professionals, needed to work and advise for the ailing mankind. She is a social worker, prone to work in the field any time she is called upon to do so. Her experience as a worker and an organiser should not be wasted. The members of this Association have also to be with her when she has proved her integrity to take overall responsibility to see that the people of her State are healthier.

There are many matters in the practice of socialised medicine. In our society the needs of the people are as numerous as they are complex. The mode of health propaganda practised at present might not have touched the fringe of the vast scientific progress marahalled in the methods of diagnosis and treatment of diseases. But with the help of our popular government we may be able to make a start at least to educate our people on elementary principles of personal and environmental hygiene and protect them against epidemics and save the health of our women and children by organising a network of health, maternity and child welfare leagues and centres. Very recently an article on "The Hospital of the Future" published in the Journal of I.M.A., February 1, 1958, has entrenched me to think for setting up an advisory bureau sponsored by the State Branch of Indian Medical Association which will function as a technical advisory

DR. GEORGE PATNAIK
PRESIDENT

body co-opting other health personnel, engineers, social workers etc., to ensure the objective approval of the health needs of the people. Bravo's suggestions in the article referred to above are to solve problems as they locally exist and the bureau envisaged by me can easily advise the government of the bed : population ratio taking into consideration the variations in needs and resources of different people at the different parts of the State.

The institutions situated in our district headquarters and at Cuttack may be outdated without the advanced advantage of radiotherapy, radioactive tracers, electronic microscope etc.; the social needs and approaches to health and disease might not have developed in par with recent progress of the science ; but the increasing urbanised habits of our people and the rapid industrialisation of the country has already created a demand for creating an environ in bringing out the changing concepts of our outpatient departments with provision of more trained medico-social workers. Our general and special hospitals have to be put on a better horizon of development with integrated schemes of ambulatory, after-care and invalid homes. We are yet to organise our medical and social rehabilitation centres throughout the state. These and other urgent matters for improvement of the health of the nation warrant immediate handling by all concerned. Without making them merely "Philosopher's Stones" let us first convince our medico-social workers (the members in the Government included) the dire necessity of producing a faithful report of the Health and Hospital Survey of our existing conditions in the lines through which W.H.O. has surveyed Ceylon (1951), Egypt (1952) and Turkey (1956).

All matters of planning need group accomplishments while details are worked out and implemented. In this country we are planning to make people health-conscious by putting up different schemes drawn out by different committees ; they are creative in the framework of commitments of the government. These commitments cannot be discarded simply because they are out of date and worn out nor the new ones accepted as such for their freshness without being tested for their relevancies in being acceptable and adaptable to the people. All our plans should be free from ambiguity and confusion worked-up with cliques ; untested individual contributions or disagreements impatiently made by attacks on personal level in subtle ways after examining few distorted fragments of the whole plan should be avoided. All our plans should therefore conform strictly to the methodology of science in their isolation, implementation and assessment if we want to see our teeming millions in bouncing health.

EMPLOYEES' STATE INSURANCE CORPORATION

The members of this Association are well aware of the stand reiterated by our Working Committee and Central Council at Bangalore to extend medical benefits to the families of insured workers through the Employees' State Insurance Corporation. The personal doctor-patient relationship has its added advantage to the family co-operating with a Panel System of practice as envisaged by I.M.A. I hope the question of capitation fee will be finally agreed upon in the interest of national welfare. I wonder if every one of us is acquainted with E.S.I.C. and its impact on the general practitioners. I request the members of this Association to give the issue a little more thought particularly with regard to the insurance medical practitioners.

GENERAL PRACTITIONERS

Dr. Louis H. Bauer, Secretary-General of the World Medical Association, laid emphasis on the doctor-patient relationship and on the privileged position of the General Practitioners in being intimate with patients' home environments or family. The family doctor (a general practitioner) is indeed the pivot of our profession to deal with physical and mental sufferings of a man which a specialist is not expected to be conversant with. The present-day tendency of laying more stress on the specialists' role should be balanced by giving an intensive thought to the role of the general practitioners. The general practitioners' colleges in England, U.S.A., Canada and Australia have already organised regular post-graduate training for general practitioners at regular intervals. We in India have unnecessarily delayed to think of starting general practitioners' colleges though 85 to 90 per cent of our population depend on general practitioners. Condensed M.B.B.S. Course once organised is not the answer to the problem. May I respectfully wish our medical educators and health administrators to give the general practitioners the chance of getting the required postgraduate training at regular intervals irrespective of pay, status etc. Such courses can be planned in the existing medical colleges with no or little cost.

FAMILY PLANNING

In national welfare and national planning the question of regulating India's teeming millions cannot be neglected. As medical biologists, doctors can gain fuller understanding of human fertility and the means of regulating it. The programme of family planning first of all needs creating an active public opinion and the promotion of family planning advice and services can be better effected in hospitals than elsewhere. With the emphasis on family planning in the Second Five Year Plan our State probably has lagged behind to set up enough family planning centres."

* * * *

The following resolutions were passed in the open session of the 10th Orissa State Medical Conference :

It is resolved from the chair that this Conference records its deep sense of sorrow on the sad demise of the following and convey its heartfelt condolence to the members of the bereaved families.

1. Maulana Abul Kalam Azad. 2. Pandit Lingaraj Misra. 3. Bhubananda Das. 4. Sarangadhar Das. 5. Dr. G. N. Sahu. 6 Dr. D. P. Das. 7. Dr. N. K. Dora.

1. The following lines to be added to the procedure No. 6 the appendix "A" of the constitution of the Orissa State Branch.

"The Organising Secretary of the Reception Committee in consultation with the inviting branch and the Chairman of the Reception Committee (i.e., Executive of Reception Committee) to carry out all details of the State conference and refer to the Reception Committee for formal approval."

2. A Sub-Committee should be formed at an early date to revise and modify the old constitution of the Orissa State Branch, I.M.A. The following members are elected to form the sub-committee : *Chairman and Convener*—Dr. K. N. Misra. *Members*—Dr. G. C. Pattnayak and Dr. R. N. Sahu.

3. The Government be requested to take adequate step to control the quackery in medicine which is increasing rapidly in the State and to consider the practice of modern system of medicine by any body other than Registered Medical Practitioners as a cognisable offence.

4. The State Government be requested to adopt the same scale of pay and status for the medical officers in State service as recommended by the Indian Medical Association for the civilian doctors under the Central Government.

5. The State Government be requested to make primary and revaccination compulsory by law, due to the spread of epidemic of smallpox.

6. The State Government be requested to implement the recommendations of the last Health Minister's Conference at Bangalore, regarding extension of age superannuation from 55 to 58 years for doctors, as early as possible as there is acute shortage of medical and health personnel in the State of Orissa.

7. The State Government be requested again to integrate the Health Services at all stages, which will facilitate better achievement of the objective of health programme and more co-ordinated social welfare with the available health personnel and existing expenditure.

8. The State Government be requested to keep all the personnel of Health Department under the administrative control of the Health Directorate.

9. The State Government be requested to exempt all essential drugs for life saving purpose from Sale Tax to relieve the poor and middle class people from heavy taxation.

10. The State Government be requested again to establish a Sera and Vaccine Institute to manufacture smallpox and other vaccines in Orissa.

11. The State Government be requested to enforce the maintenance of a death and birth register in all municipalities in the State of Orissa.

12. The State Government be requested to reiterate the resolutions passed by the 9th Orissa Medical Conference held at Sambalpur in 1957 as most of them are not yet implemented.

XXXV ALL-INDIA MEDICAL CONFERENCE, CUTTACK, 1958

The Organisers of the XXXV All-India Medical Conference, Cuttack (Orissa), have issued the following :

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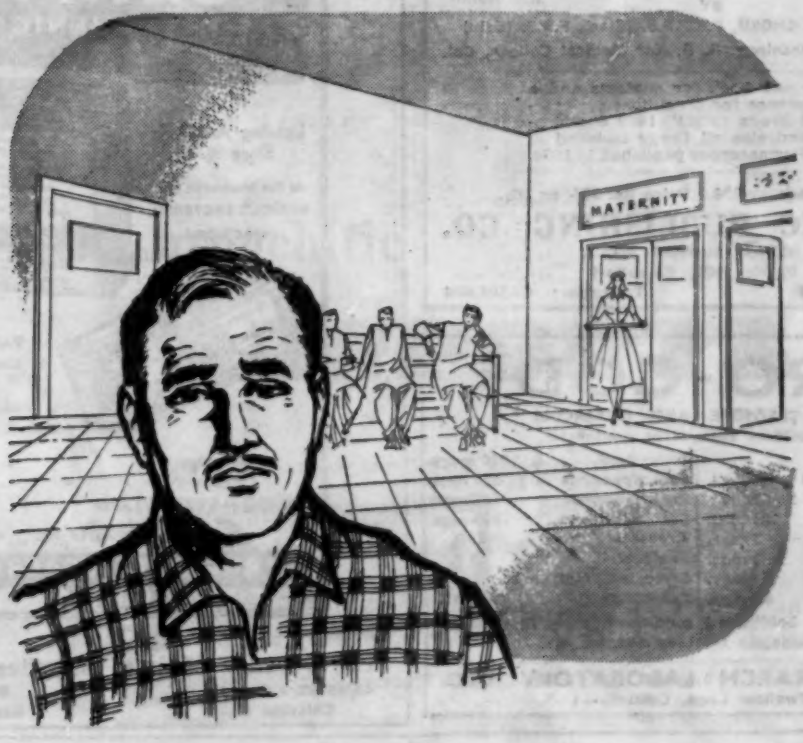
The climate of Orissa in the month of December is equable.

All correspondences may please be made with the Organising Secretary, Office of the XXXV All-India Medical Conference, S. C. B. Medical College Compound, Cuttack, Orissa.



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